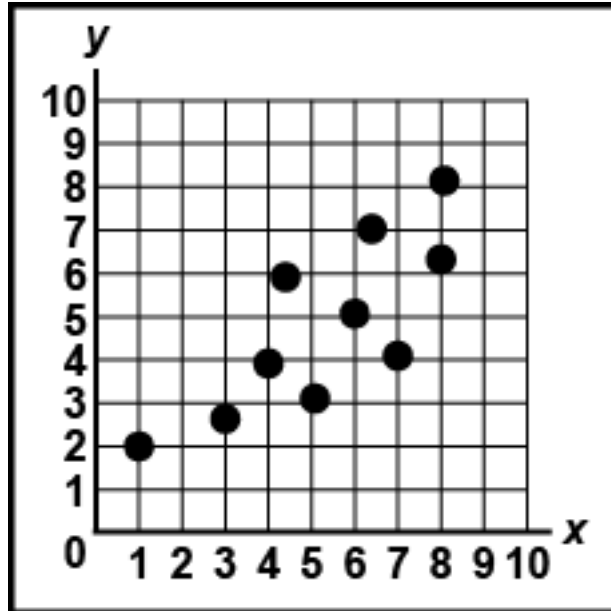


| | |
|---|--|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.DASP.1.a.1: Graph bivariate data using scatter plots and identify possible associations between the variables. |
| IAS Standard | MA10.DASP.1: Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantitative variables. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | Context allowable |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | positive association, negative association |
| Cognitive Complexity | 6 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify a scatter plot from a provided data table. |
| | Tier 2 The student can identify if an association is present and can identify the direction. |
| | Tier 3 The student can use a scatter plot to predict an outcome. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Which graph is a scatter plot?

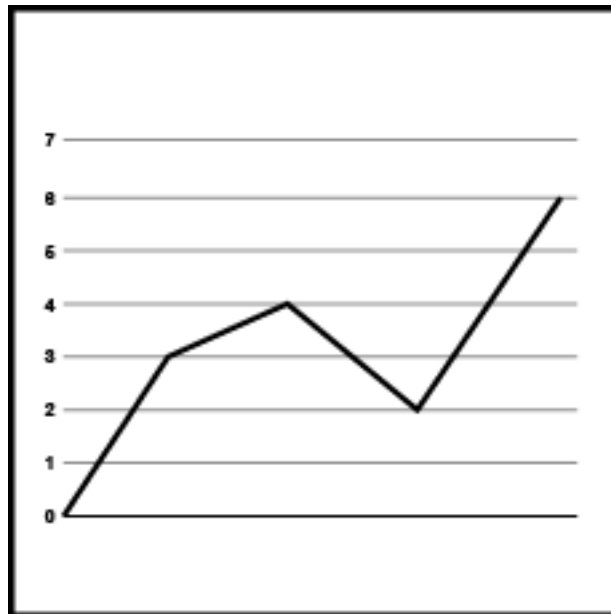


A.

KEY

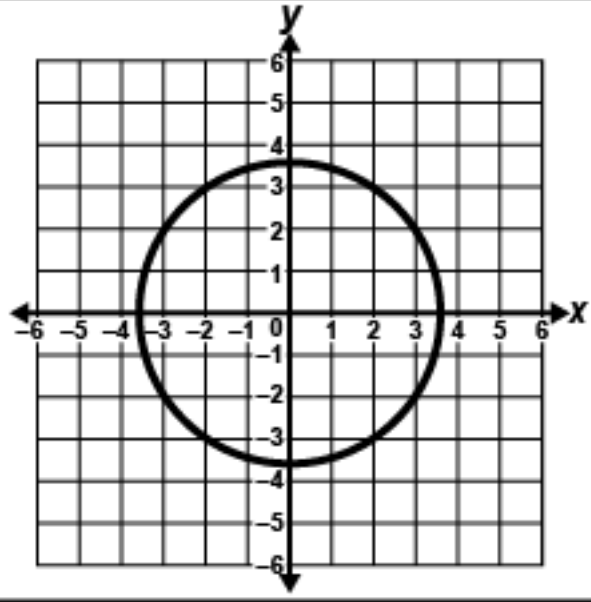
(audio: the graph has many dots that represent data points.)

Tier 1



B.

(audio: the graph has a line on it)

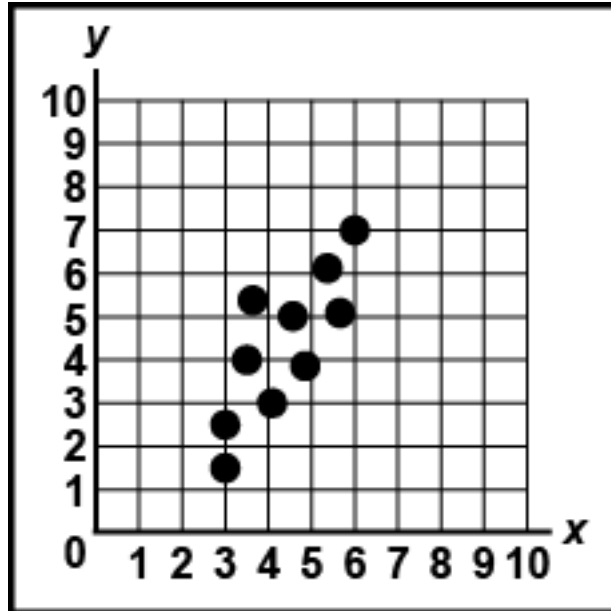


C.
(audio: the graph has a circle on it)

| | |
|---|--|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.DASP.1.a.2: Using scatter plots, identify data points that appear to be outliers. |
| IAS Standard | MA10.DASP.1: Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantitative variables. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | outlier |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify a significant outlier. |
| | Tier 2 The student can identify a significant outlier. |
| | Tier 3 The student can identify a significant outlier. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

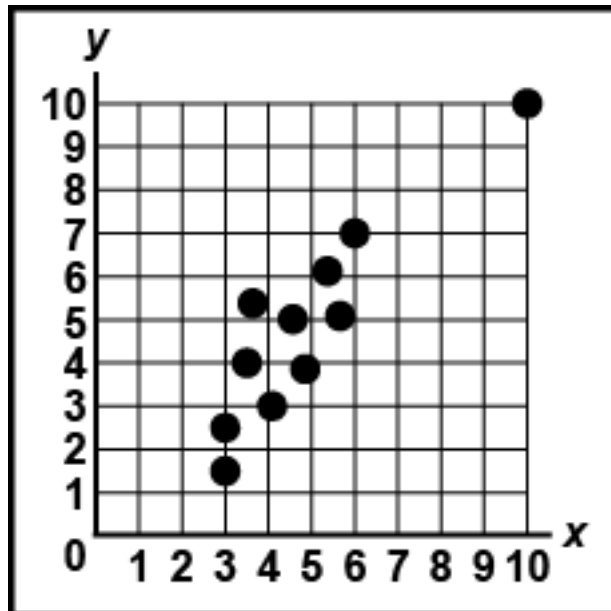
Which graph shows an outlier?



A.

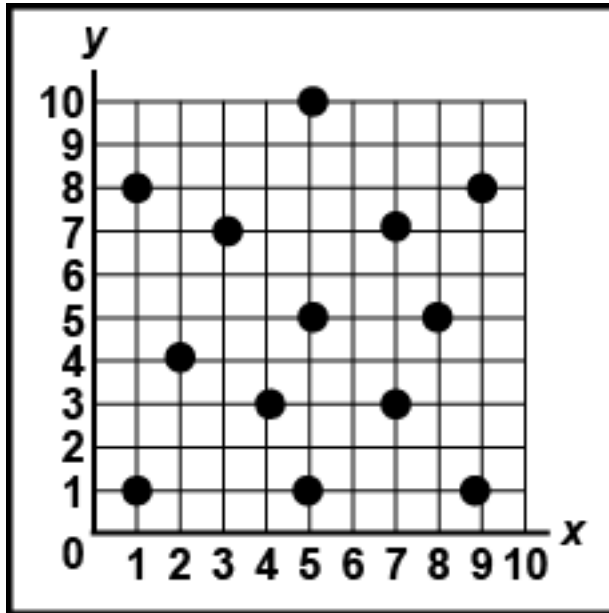
(audio: a graph with points plotted in a straight line)

Tier 2



B.

(audio: a graph with points plotted between x equals three and x equals six, with one point at the coordinates ten, ten)



C.

(audio: a graph with points evenly spread in quadrant one)

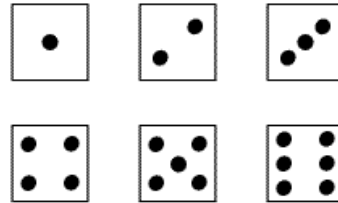
| | |
|---|--|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.DASP.2.a.1: Determine the theoretical probability of multi-stage probability experiments (2 coins, 2 dice). |
| IAS Standard | MA10.DASP.2: Represent sample spaces and find probabilities of compound events (independent and dependent) using methods, such as organized lists, tables, and tree diagrams. |
| Content Limits | Maximum of 6-by-6 sample space. |
| Allowable Stimulus Material | N/A |
| Context | Context required |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | sample space, outcome, probability |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify the number of possible outcomes. |
| | Tier 2 The student can identify the probability from a sample space. |
| | Tier 3 The student can solve the probability. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 1

Emily is flipping a coin to see if it lands heads or tails and rolling a number cube that has the numbers from 1 to 6.

How many possible outcomes are there for Emily?



- A. 8
- B. 12**
- C. 36

| | |
|---|--|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.DASP.4.a.1: Determine whether a sampling method was random or nonrandom. |
| IAS Standard | MA10.DASP.4: Distinguish between random and non-random sampling methods, identify possible sources of bias in sampling, describe how such bias can be controlled and reduced, evaluate the characteristics of a good survey and well-designed experiment, design simple experiments or investigations to collect data to answer questions of interest, and make inferences from sample results. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | Context required |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | sample space, population, random, non-random |
| Cognitive Complexity | 6 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify a random or nonrandom sample. |
| | Tier 2 The student can identify the best population to survey. |
| | Tier 3 The student can identify a flaw in a sample. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 3

Megan surveyed 100 people leaving a movie on a Friday night about their favorite activity to do on a Friday. Her result was that everyone like to go to the movies.

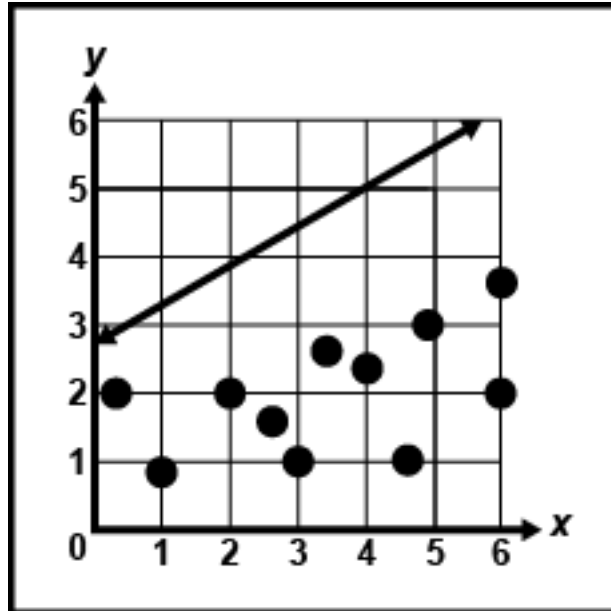
What is the flaw with Megan's survey?

- A. Her sample was too big.
- B. Her sample was too small.
- C. Her sample was not random.**

| | |
|---|--|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.DASP.6.a.1: Use the line of best fit to find a point that answers a question about the data. |
| IAS Standard | MA10.DASP.6: Find a linear function that models a relationship (with and without technology) for a bivariate data set to make predictions; interpret the slope and y-intercept, and compute (with and without technology) and interpret the correlation coefficient. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | line of best fit |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can select the line of best fit from a graph. |
| | Tier 2 The student can identify if a point is on the line of best fit. |
| | Tier 3 The student can use the line of best fit to make a prediction. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations: | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

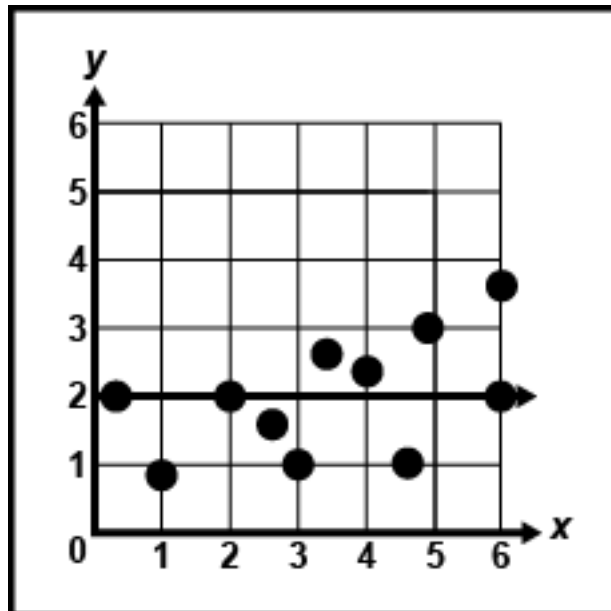
Which shows data with the correct line of best fit?



A.

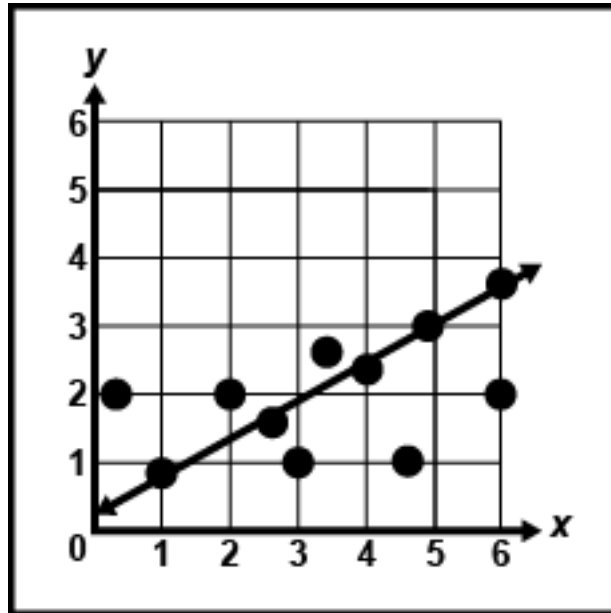
(audio: there is a line above the data points)

Tier 1



B.

(audio: the data points follow a straight line with a positive slope. The line drawn in is horizontal)



C.

(audio: the data points follow a straight line with a positive slope. The line drawn in also has a positive slope)

KEY

| | |
|---------------------------------|---|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.DASP.7.a.1: Interpret a two-way table summarizing data on two categorical variables collected from the same subjects using relative frequencies calculated for rows or columns. |
| IAS Standard | MA10.DASP.7: Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns (including joint, marginal, and conditional relative frequencies) to describe possible associations and trends in the data. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | Context required |
| Recommended Response Mechanisms | Multiple Choice (MC) Multiple Select (MS) |
| Construct-Relevant Vocabulary | frequency table, two-way table |
| Cognitive Complexity | 6 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify data on a two-way frequency table. |
| | Tier 2 The student can complete a partially filled in frequency table. |
| | Tier 3 The student can make a prediction from a table with frequencies. |

| Accessibility and Accommodation Considerations | | | | | | | | | | | | | | | | | |
|--|--|---------------|------------|---------------|-------|------|----|----|----|-------|--|----|----|-------|----|----|----|
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. | | | | | | | | | | | | | | | | |
| Linguistic Complexity | To be determined after IDOE review | | | | | | | | | | | | | | | | |
| Reference Tools | N/A | | | | | | | | | | | | | | | | |
| Sample Item | | | | | | | | | | | | | | | | | |
| Tier 2 | <p>Kristie created a two-way table to show data about students in her school.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Math Class</th> <th>Science Class</th> <th>Total</th> </tr> </thead> <tbody> <tr> <th>Boys</th> <td style="text-align: center;">12</td> <td style="text-align: center;">14</td> <td style="text-align: center;">26</td> </tr> <tr> <th>Girls</th> <td style="text-align: center;"> </td> <td style="text-align: center;">18</td> <td style="text-align: center;">31</td> </tr> <tr> <th>Total</th> <td style="text-align: center;">25</td> <td style="text-align: center;">32</td> <td style="text-align: center;">57</td> </tr> </tbody> </table> <p>Which number goes in the blank space in the Math Class column?</p> <p>A. 13 B. 15 C. 30 D. 33</p> | | Math Class | Science Class | Total | Boys | 12 | 14 | 26 | Girls | | 18 | 31 | Total | 25 | 32 | 57 |
| | Math Class | Science Class | Total | | | | | | | | | | | | | | |
| Boys | 12 | 14 | 26 | | | | | | | | | | | | | | |
| Girls | | 18 | 31 | | | | | | | | | | | | | | |
| Total | 25 | 32 | 57 | | | | | | | | | | | | | | |

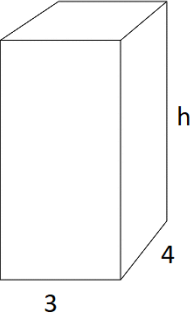
| | |
|---------------------------------|---|
| Reporting Category | Equations and Inequalities (Linear and Systems) |
| Content Connector | MA10.EI.1.a.1: Solve linear equations with integer coefficients using one or two steps. |
| IAS Standard | MA10.EI.1: Solve linear equations with rational number coefficients fluently, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. Represent real-world problems using linear equations and inequalities in one variable and solve such problems. Explain and justify each step in solving an equation, starting from the assumption that the original equation has a solution. Justify the choice of a solution method. |
| Content Limits | Whole number coordinates. Use a variety of letters for the variables. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) Multiple Select (MS) Table Match (TM) Equation Response (EQ) |
| Construct-Relevant Vocabulary | equation, solution |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can solve one-step equations with one variable. |
| | Tier 2 The student can solve a one variable two-step equation without the distributive property. |
| | Tier 3 The student can solve two-step equations with up to two variables using the distributive property. The student can solve a linear equation using a graph. |

| Accessibility and Accommodation Considerations | |
|--|--|
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

| Sample Item | |
|---------------|--|
| Tier 1 | <p>Here is an equation.</p> $2 + x = 5$ <p>What is the value of x?</p> <p>A. 2 B. 3 C. 5</p> |

Updated: 07/19

| | |
|---------------------------------|---|
| Reporting Category | Geometry and Measurement |
| Content Connector | MA10.EI.1.a.3: Solve a linear equation to find a missing attribute given the area, surface area, or volume and the other attribute. |
| IAS Standard | MA10.EI.1: Solve linear equations with rational number coefficients fluently, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. Represent real-world problems using linear equations and inequalities in one variable and solve such problems. Explain and justify each step in solving an equation, starting from the assumption that the original equation has a solution. Justify the choice of a solution method. |
| Content Limits | Only one side is unknown. Use rectangular prisms. Use rectangles. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | N/A |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 Provided a visual support with a grid, the student can, given all the dimensions, identify the area. |
| | Tier 2 Given all the dimensions, the student can identify volume. |
| | Tier 3 The student can solve for a missing dimension. |

| Accessibility and Accommodation Considerations | |
|--|--|
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |
| Sample Item | |
| Tier 3 | <p>Here is a rectangular prism.</p>  <p>The volume of this rectangular prism is 72.</p> <p>What is the height?</p> <p>A. 5 B. 6 C. 7 D. 8</p> |

| | |
|---|--|
| Reporting Category | Equations and Inequalities (Linear and Systems) |
| Content Connector | MA10.EI.2.a.1: Recognize when a linear equation has one solution, infinitely many solutions, or no solutions. |
| IAS Standard | MA10. EI.2: Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by transforming a given equation into simpler forms, until an equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). |
| Content Limits | 3 rows, 3 columns in matching tables. Linear equations. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) Multiple Select (MS) Table Match (TM) Equation Response (EQ) |
| Construct-Relevant Vocabulary | linear equation, equation, solution |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can match the correct number of solutions with a completed equation. |
| | Tier 2 The student can solve and determine the solutions to a one-step equation. |
| | Tier 3 The student can solve and determine the solutions of an equation that has no more than two steps. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

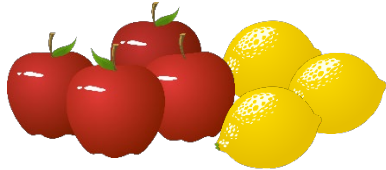
| Sample Item | |
|---------------|---|
| Tier 2 | <p>Here is an equation.</p> $3x = 12$ <p>What is x equal to in this equation?</p> <p>A. 4 B. 6 C. 9</p> |

Updated: 07/19

| | |
|---|--|
| Reporting Category | Equations and Inequalities (Linear and Systems) |
| Content Connector | MA10.EI.3.a.1: Translate a real-world problem into a one-variable linear equation. |
| IAS Standard | MA10.EI.3: Represent real-world problems using linear equations and inequalities in one variable and solve such problems. Interpret the solution and determine whether it is reasonable. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | Context required |
| Recommended Response Mechanisms | Multiple Choice (MC) Multi-Select (MS) Matching Table (MT) Equation Response (EQ) |
| Construct-Relevant Vocabulary | Equation; variable |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify a one-step equation from a given situation. |
| | Tier 2 The student can define the variable of interest. |
| | Tier 3 The student can identify a multi-step equation from a given situation. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

| Sample Item | |
|---------------|---|
| Tier 2 | <p>A carpenter uses the equation $y = 25x$ to determine how much to charge his customers. He charges \$25 for each hour of work.</p> <p>What does the x represent in the equation?</p> <ul style="list-style-type: none">A. number of hoursB. total costC. hourly rate |

| | |
|---|--|
| Reporting Category | Equations and Inequalities (Linear and Systems) |
| Content Connector | MA10.EI.4.a.1: Represent a real-world situation using a proportion. |
| IAS Standard | MA10.EI.4: Represent real-world and other mathematical problems using an algebraic proportion that leads to a linear equation and solve such problems. |
| Content Limits | For Tier 1, use whole numbers. Tier 1 and Tier 2 do not need to show reducing. |
| Allowable Stimulus Material | |
| Context | Context required |
| Recommended Response Mechanisms | Multiple Choice (MC) Multiple Select (MS) Table Match (TM) Equation Response (EQ) |
| Construct-Relevant Vocabulary | ratio, proportion |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 Given a situation, the student can identify the proportion. |
| | Tier 2 Given a situation, the student can identify the proportion. |
| | Tier 3 Given a situation, the student can identify multiple proportions. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | tables, charts |

| Sample Item | |
|---------------|---|
| Tier 1 | <p>Here is a group of fruit.</p>  <p>What is the ratio of apples to lemons?</p> <p>A. 4 to 3 B. 4 to 7 C. 4 to 1</p> |

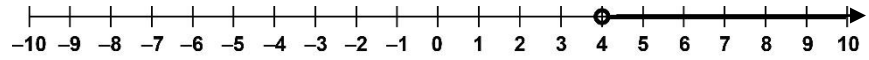
Updated: 07/19

| | |
|---|--|
| Reporting Category | Equations and Inequalities (Linear and Systems) |
| Content Connector | MA10.EI.5.a.1: Identify solutions from the graph of a linear inequality within a real-world problem. |
| IAS Standard | MA10.EI.5: Represent real-world problems using linear inequalities in two variables and solve such problems; interpret the solution set and determine whether it is reasonable. Solve other linear inequalities in two variables by graphing. |
| Content Limits | Use two or fewer variables. |
| Allowable Stimulus Material | N/A |
| Context | Context required |
| Recommended Response Mechanisms | Multiple Choice (MC) Multiple Select (MS) Table Match (TM) Equation Response (EQ) |
| Construct-Relevant Vocabulary | inequality, solution, number line |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify an ordered pair as a solution in a graph. |
| | Tier 2 The student can identify the linear inequality from a graph. |
| | Tier 3 The student can provide a solution to a given inequality. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 2

Here is a number line.



What is the inequality given on the number line?

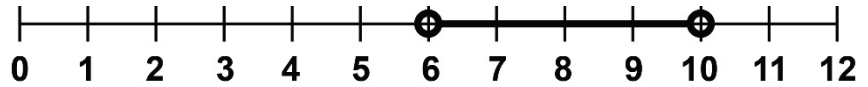
- A. $x > 4$
- B. $x < 4$
- C. $x = 4$

| | |
|---|--|
| Reporting Category | Equations and Inequalities (Linear and Systems) |
| Content Connector | MA10.EI.6.a.1: Find a solution of compound inequalities given a graph. |
| IAS Standard | MA10.EI.6: Solve compound linear inequalities in one variable and represent and interpret the solution on a number line. Write a compound linear inequality given its number line representation. |
| Content Limits | Tier 1 should be whole numbers greater than 0. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) Multiple Select (MS) Table Match (TM) Equation Response (EQ) |
| Construct-Relevant Vocabulary | inequality, solution, number line |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify if a value is in a solution set based on a graph. |
| | Tier 2 The student can identify a compound inequality based on a graph. |
| | Tier 3 Student can identify the graph of a compound inequality when given the inequality. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 3

Here is an inequality on a number line.



Which inequality matches the one on the number line?

- A. $10 < x < 6$
- B. $x < 6 < 10$
- C. $6 < x < 10$

Updated: 07/19

| | |
|---|--|
| Reporting Category | Equations and Inequalities (Linear and Systems) |
| Content Connector | MA10.EI.7.a.1: Solve literal equations for a specified variable. |
| IAS Standard | MA10.EI.7: Solve equations and formulas for a specified variable, including equations with coefficients represented by variables. |
| Content Limits | Items may require addition. Items may require subtraction. Items may require multiplication. Items may require division. |
| Allowable Stimulus Material | N/A |
| Context | No Context |
| Recommended Response Mechanisms | Multiple Choice (MC) Multiple Select (MS) Table Matching (TM) Equation Response (EQ) |
| Construct-Relevant Vocabulary | equation, equivalent |
| Cognitive Complexity | 6 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify an equivalent one-step equation. |
| | Tier 2 The student can identify an equivalent two-step equation. |
| | Tier 3 The student can identify the steps in solving literal equations. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

| Sample Item | |
|---------------|--|
| Tier 1 | <p>Here is an equation.</p> $x - 3 = 7$ <p>Which equation is equivalent to the one above?</p> <p>A. $x + 3 = 7$</p> <p>B. $x + 7 = 3$</p> <p>C. $x - 2 = 8$</p> |

| | |
|---|--|
| Reporting Category | Equations and Inequalities (Linear and Systems) |
| Content Connector | MA10.EI.8.a.1: Evaluate the absolute value of an expression. |
| IAS Standard | MA10.EI.8: Solve absolute value linear equations in one variable. |
| Content Limits | Use integers. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) Multiple Select (MS) Table Match (TM) Equation Response (EQ) |
| Construct-Relevant Vocabulary | absolute value, expression |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify the absolute value of a number. |
| | Tier 2 The student can determine the solution to a one-step expression. |
| | Tier 3 The student can determine the solution to a two-step expression. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

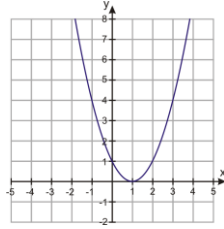
| Sample Item | |
|---------------|--|
| Tier 3 | <p>Here is an expression.</p> $ -4 - 3 $ <p>What is this expression equal to?</p> <ul style="list-style-type: none">A. -7B. -1C. 1D. 7 |

| | |
|---|--|
| Reporting Category | Equations and Inequalities (Linear and Systems) |
| Content Connector | MA10.EI.9.a.1: Identify an absolute value graph. |
| IAS Standard | MA10.EI.9: Graph absolute value linear equations in two variables. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | absolute value, graph |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify the graph of an absolute value equation. |
| | Tier 2 The student can select the graph of an absolute value equation from multiple types of graphs. |
| | Tier 3 The student can identify the graph of a specific absolute value equation with one step. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

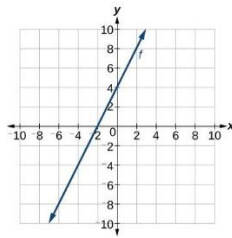
Sample Item

Tier 1

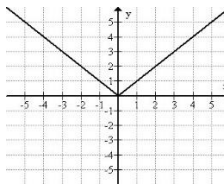
Which graph is the graph of an absolute value?



A.
(audio: a graph of a parabola)



B.
(audio: a graph of a straight line)



C.
(audio: a graph of two straight lines that make a "v" shape)

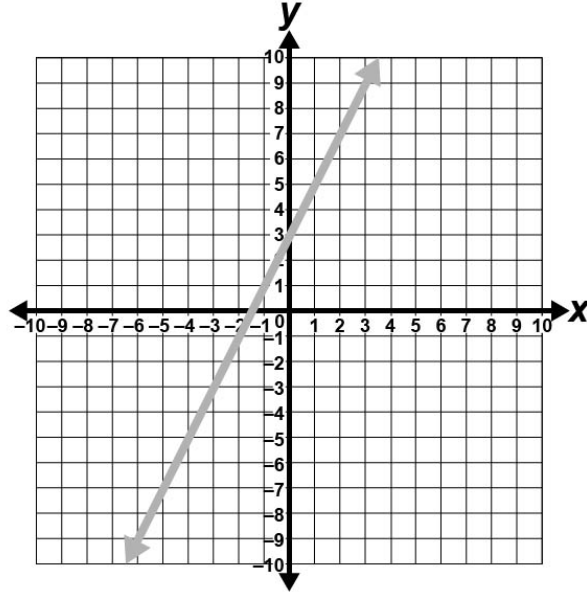
KEY

| | |
|---|--|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.F.1.a.1: Given multiple representations, describe a function as linear and not linear. |
| IAS Standard | MA10.F.1: Interpret the equation $y = mx + b$ as defining a linear function whose graph is a straight line; give examples of functions that are not linear. Describe similarities and differences between linear and nonlinear functions from tables, graphs, verbal descriptions, and equations. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) Multiple Select (MS) |
| Construct-Relevant Vocabulary | linear |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can select a linear function from a set of graphs. |
| | Tier 2 The student can select a linear function given graphs or equations. |
| | Tier 3 The student can select a linear function using any representation. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Which function is linear?

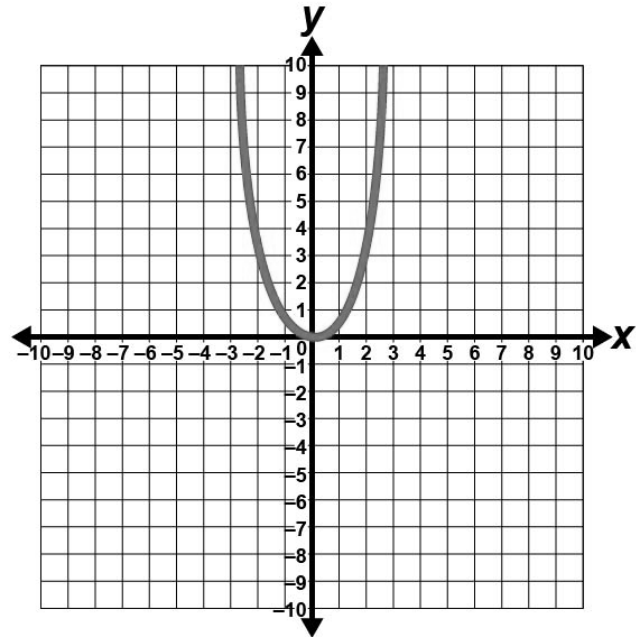
A. KEY



Tier 2

B. $y = x^2 - 2$

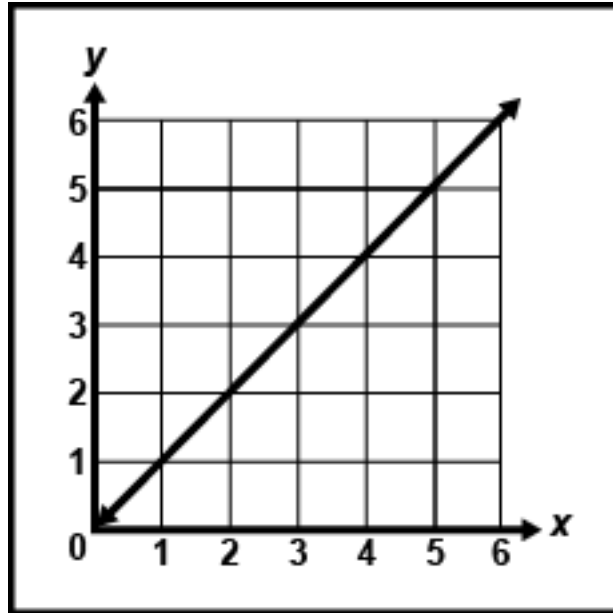
C.



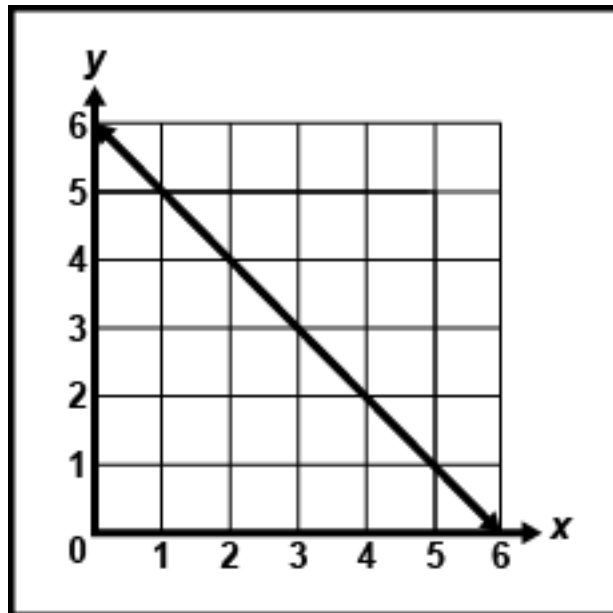
| | |
|---|---|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.F.2.a.1: Identify the rate of change (slope) and initial value (y-intercept) from graphs. |
| IAS Standard | MA10.F.2: Construct a function to model a linear relationship between two quantities given a verbal description, table of values, or graph. Recognize in $y = mx + b$ that m is the slope (rate of change) and b is the y-intercept of the graph and describe the meaning of each in the context of a problem. |
| Content Limits | Include integer values for y-intercept. |
| Allowable Stimulus Material | N/A |
| Context | Context allowable |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | slope (avoid “rate of change”; avoid “initial value”) |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify the y-intercept. |
| | Tier 2 The student can identify positive or negative slope for a graph. |
| | Tier 3 The student can identify the slope of a given graph and y-intercept. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Which line has a positive slope?

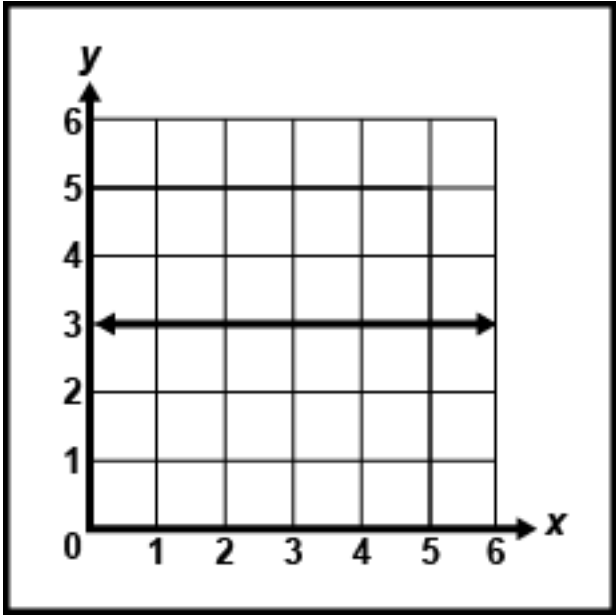
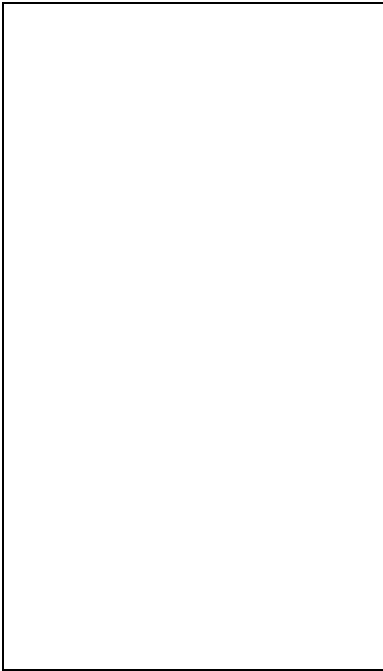


A.
KEY



B.

Tier 2



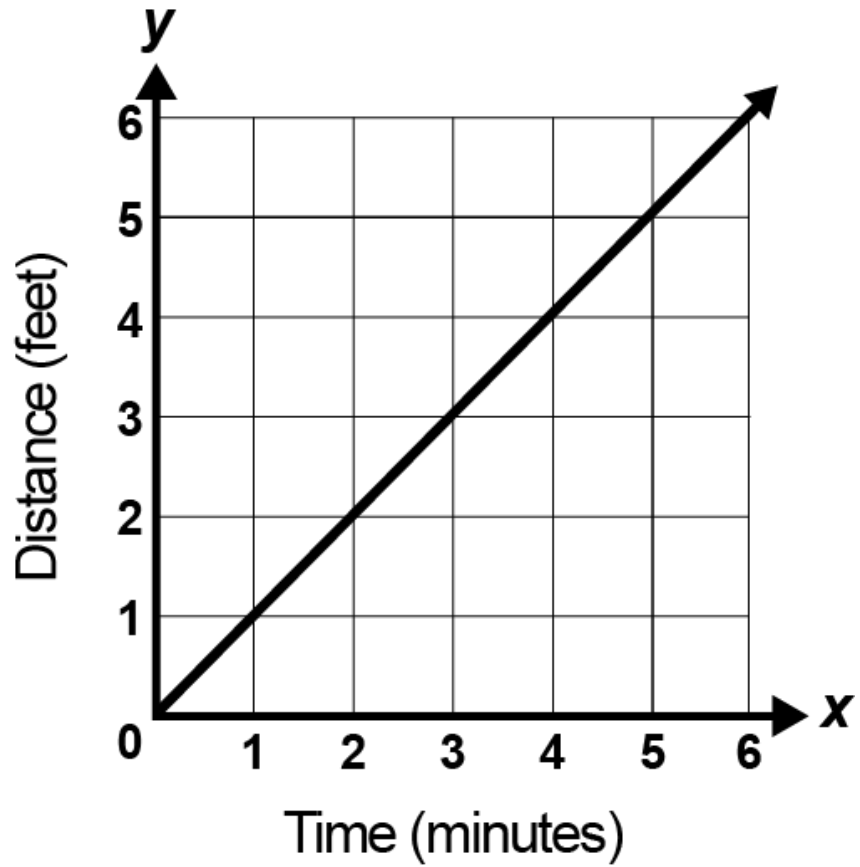
C.

| | |
|---|--|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.F.4.a.1: Interpret the rate of change using graphical representations of a real-world situation. |
| IAS Standard | MA10.F.4: Represent real-world problems that can be modeled with a linear function using equations, graphs, and tables; translate fluently among these representations, and interpret the slope and intercepts. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | Context required |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | rate of change, increasing, decreasing |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify what is changing in a given situation. |
| | Tier 2 The student can identify if it is an increasing or decreasing rate of change. |
| | Tier 3 The student can determine the units for the rate of change. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 1

Here is a graph.



What is changing as time increases?

- A. Speed
- B. Distance**
- C. no change

| | |
|---|--|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.F.5.a.1: Describe the attributes of an equation given various forms. |
| IAS Standard | MA10.F.5: Translate among equivalent forms of equations for linear functions, including slope-intercept, point-slope, and standard. Recognize that different forms reveal more or less information about a given situation. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | Slope, y -intercept, x -intercept (avoid names of equation forms) |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify the slope or y -intercept when given in slope intercept form. |
| | Tier 2 The student can identify the slope or y -intercept when given in point intercept form. |
| | Tier 3 The student can identify the x and y intercept in standard form. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

| Sample Item | |
|---------------|--|
| Tier 2 | <p>Here is a linear equation.</p> $y - 2 = 3(x + 1)$ <p>What is the slope of this equation?</p> <p>A. 1 B. -2 C. 3</p> |

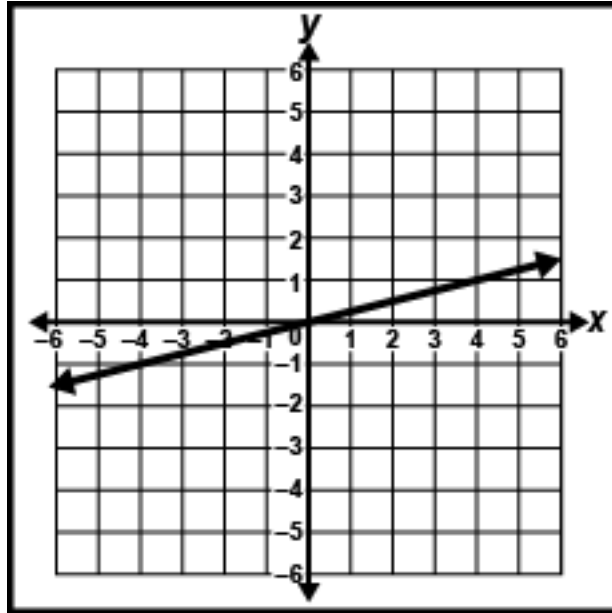
| | |
|---|--|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.F.6.a.1: Given a table or a graph, compare two linear functions to answer a question about rates. |
| IAS Standard | MA10.F.6: Compare properties of two linear functions given in different forms, such as a table of values, equation, verbal description, and graph (e.g., compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed). |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) Multiple Select (MS) Table Match (TM) Equation Response (EQ) |
| Construct-Relevant Vocabulary | rate of change |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify a greater rate of change from a graph. |
| | Tier 2 The student can identify a greater rate of change from a table. |
| | Tier 3 The student can identify a greater rate of change between a graph and a table. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

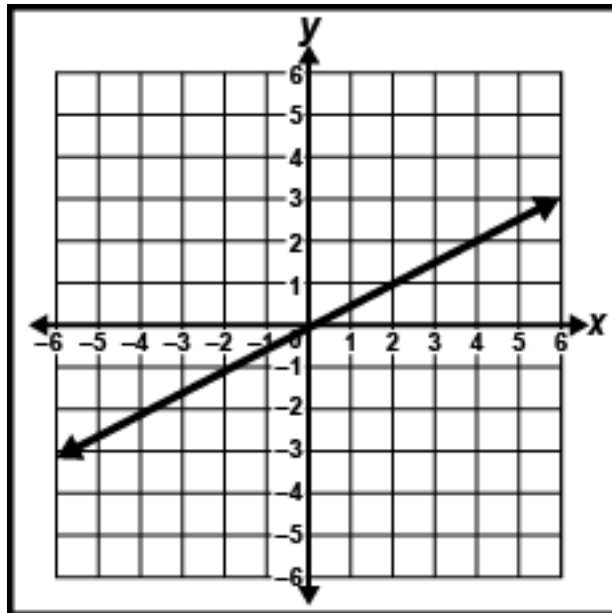
Which line has the greatest rate of change?

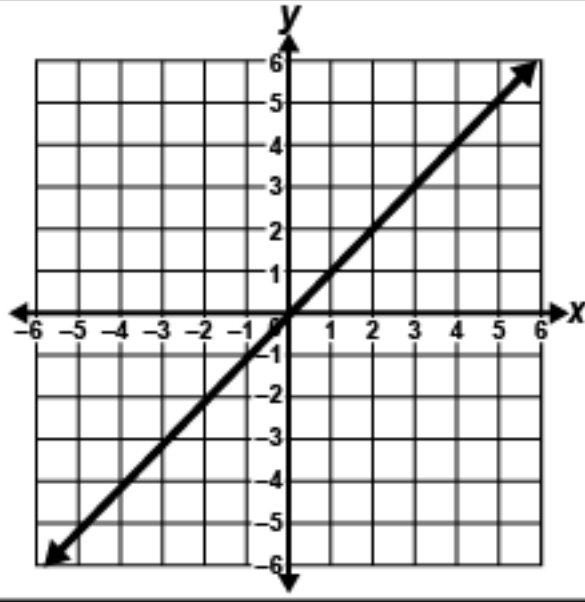
Tier 1

A.



B.





C.

KEY

| | |
|---|---|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.F.7.a.1: Distinguish between functions and non-functions within graphs or tables. |
| IAS Standard | MA10.F.7: Understand that a function from one set (called the domain or independent variable) to another set (called the range or dependent variable) assigns to each element of the domain exactly one element of the range. Understand that if f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . Understand the graph of f is the graph of the equation $y = f(x)$. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | Function, graph, table |
| Cognitive Complexity | 6 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can select a function from set of graphs. |
| | Tier 2 The student can select a function given graphs or tables. |
| | Tier 3 The student can complete a table for a function with a missing value. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 3

Here is a table of values for $f(x) = 3x + 7$.

| x | $f(x)$ |
|-----|--------|
| 1 | 10 |
| 2 | 13 |
| 3 | 16 |
| 4 | 19 |
| 5 | |

What is the missing value in the table?

- A. 15
- B. 20
- C. 22

| | |
|---|--|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.F.8.a.1: Identify the domain and range from a table or graph. |
| IAS Standard | MA10.F.8: Identify the domain and range of relations represented in tables, graphs, verbal descriptions, and equations. |
| Content Limits | Graphs of discrete points. Tables with four rows. If context is used, domain restrictions should be based on the graph, rather than on contextual limitations, though any contextual limitations on domain/range should be in the table/data provided. |
| Allowable Stimulus Material | N/A |
| Context | Context allowable |
| Recommended Response Mechanisms | Multiple Choice |
| Construct-Relevant Vocabulary | domain, range |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify a domain or range from the table. |
| | Tier 2 The student can identify a domain or range from either representation. |
| | Tier 3 The student can identify a domain or range with repeated inputs/outputs. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 1

Here is a table representing a function.

| x | y |
|---|---|
| 0 | 0 |
| 1 | 1 |
| 2 | 4 |
| 3 | 9 |

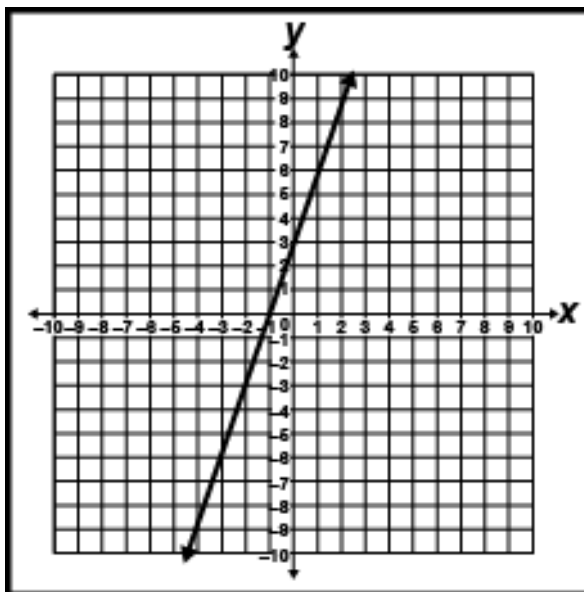
What is the domain of this function?

- A. {0, 1, 4, 9}
- B. {0, 1, 2, 3}**
- C. {0, 1, 2, 3, 4, 9}

| | |
|---|--|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.F.9.a.1: Given the qualitative features, sketch a graph. |
| IAS Standard | MA10.F.9: Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear, has a maximum or minimum value). Sketch a graph that exhibits the qualitative features of a function that has been verbally described. Identify independent and dependent variables and make predictions about the relationship. |
| Content Limits | Tier 3 can address maximum and minimum. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | Increasing, decreasing, slope; y-intercept, linear, maximum, minimum |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify a graph when given one qualitative feature. |
| | Tier 2 The student can identify a graph given two qualitative features. |
| | Tier 3 The student can identify a graph given multiple qualitative features. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

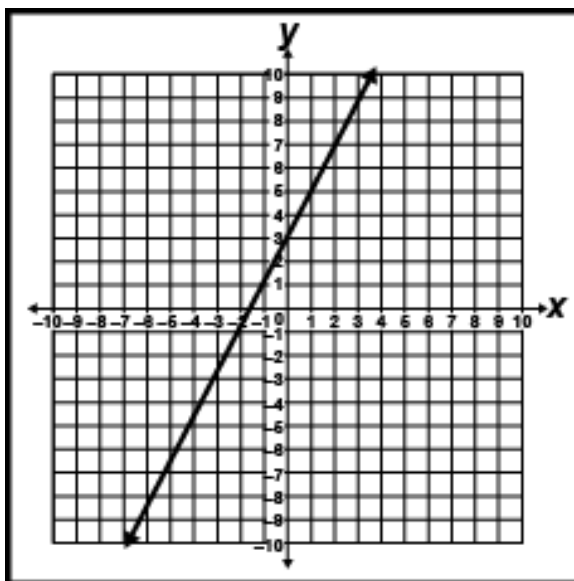
Which graph has a slope of 2 and a y-intercept of 3?



A.

(audio: a graph of a line that goes through the point zero, three, and the point one, three, six)

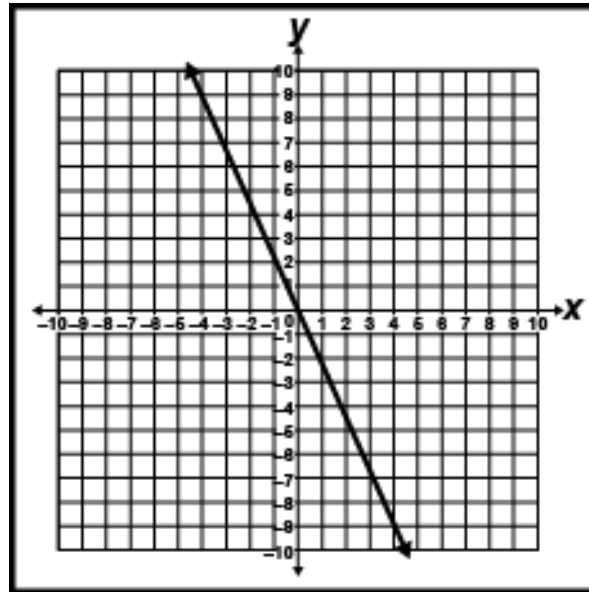
Tier 2



B.

(audio: a graph of a line that goes through the point zero, three, and the point one, five)

KEY



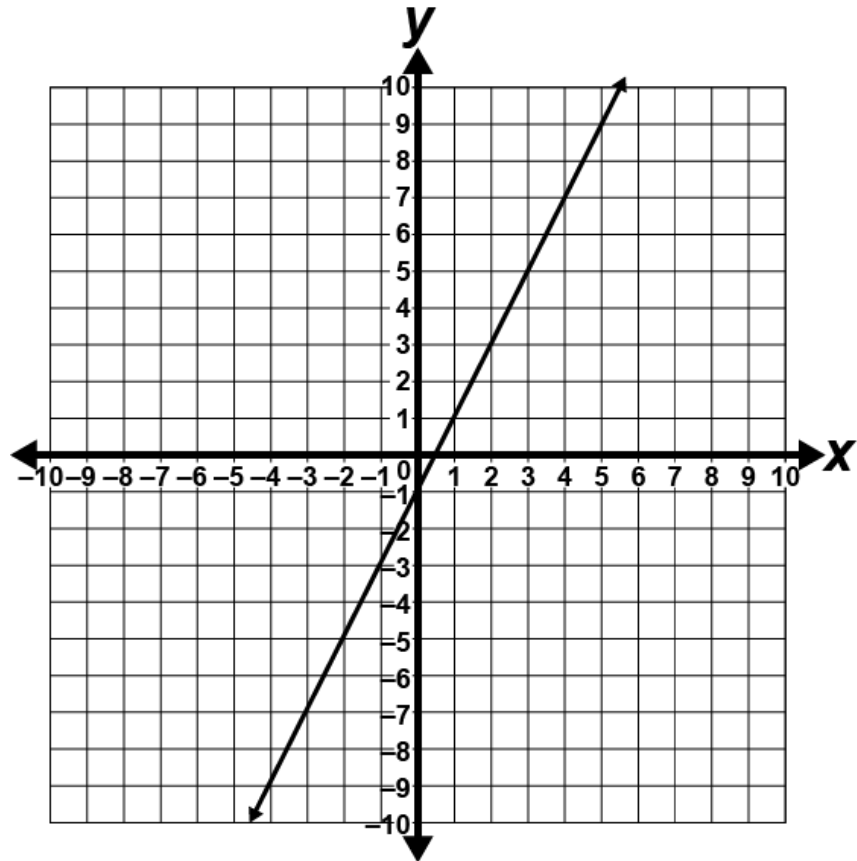
C.

(audio: a graph of a line that goes through the point zero, zero and the point one, negative two)

| | |
|---|--|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.F.9.a.2: Given a sketch, describe and make predictions about the relationship between the variables. |
| IAS Standard | MA10.F.9: Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear, has a maximum or minimum value). Sketch a graph that exhibits the qualitative features of a function that has been verbally described. Identify independent and dependent variables and make predictions about the relationship. |
| Content Limits | Tier 3 can address maximum and minimum. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | Increasing, decreasing, linear, minimum, maximum |
| Cognitive Complexity | 6 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify one qualitative feature given a graph. |
| | Tier 2 The student can identify two qualitative features given a graph. |
| | Tier 3 The student can identify multiple qualitative features given a graph. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Here is the graph of a line.



Tier 3

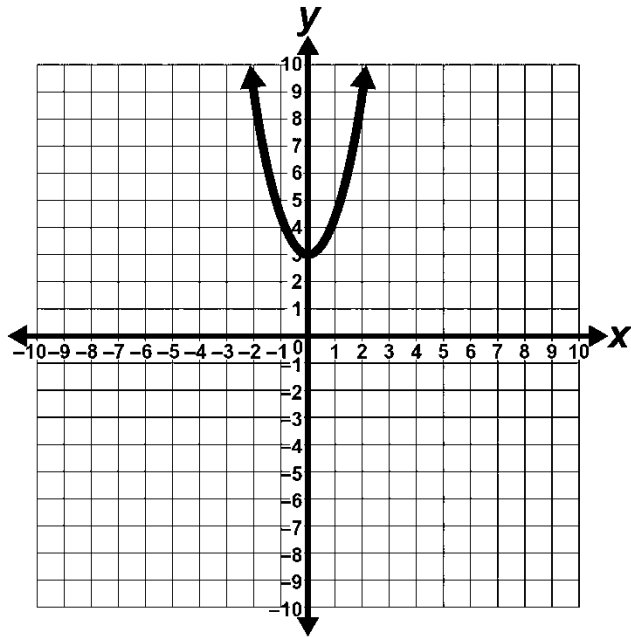
What happens to the value of y as the value of x increases?

- A. decreases
- B. increases**
- C. it stays the same

| | |
|---|--|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.F.9.a.3: Given multiple graphs, describe the defining features of a function. |
| IAS Standard | MA10.F.9: Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear, has a maximum or minimum value). Sketch a graph that exhibits the qualitative features of a function that has been verbally described. Identify independent and dependent variables and make predictions about the relationship. |
| Content Limits | Only one graph should be included per item. Tier 3 may assess maximum or minimum. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) Multiple Select (MS) |
| Construct-Relevant Vocabulary | increasing, decreasing, linear, minimum, maximum |
| Cognitive Complexity | 6 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify one qualitative feature given a graph. |
| | Tier 2 The student can identify two qualitative features given a graph. |
| | Tier 3 The student can identify multiple qualitative features given a graph. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Here is the graph of a function.



Tier 2

Which choice has two correct descriptions of the graph?

- A. It is linear and has a maximum
- B. It is non-linear and has a minimum**
- C. It is non-linear and has a maximum

| | |
|---------------------------------|---|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.F.9.a.4: Given data, create or identify a graph to model the situation |
| IAS Standard | MA10.F.9: Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear, has a maximum or minimum value). Sketch a graph that exhibits the qualitative features of a function that has been verbally described. Identify independent and dependent variables and make predictions about the relationship |
| Content Limits | Limit equations to linear equations Limit equations to quadratic equations Limit equations to exponential equations |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) Table Match (TM) |
| Construct-Relevant Vocabulary | point, coordinate, function |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify a point that is on a quadratic or exponential function. |
| | Tier 2 The student can select a point that is on a quadratic or exponential function. |
| | Tier 3 The student can provide a point that is on a quadratic or exponential function. |

| Accessibility and Accommodation Considerations | |
|--|--|
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

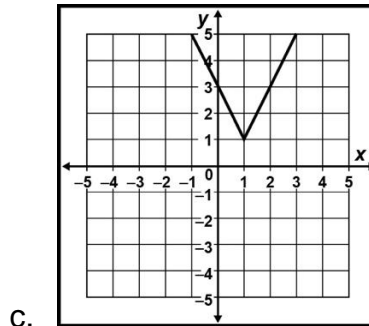
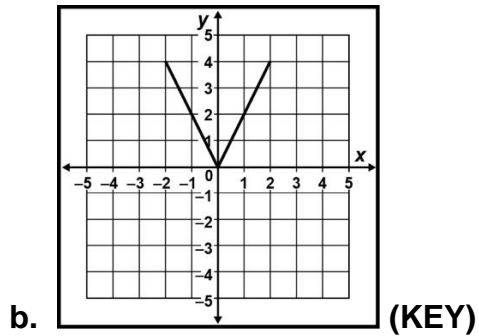
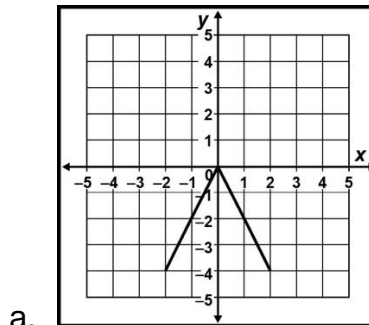
Sample Item

A table of data is shown.

| x | y |
|-----|-----|
| -2 | 4 |
| -1 | 2 |
| 0 | 0 |
| 1 | 2 |
| 2 | 4 |

Which graph matches the data?

Tier 2



| | |
|---|---|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.F.10.a.1: Interpret statements that use function notation in terms of a context. |
| IAS Standard | MA10.F.10: Understand and interpret statements that use function notation in terms of a context; relate the domain of the function to its graph and to the quantitative relationship it describes. |
| Content Limits | Integers values |
| Allowable Stimulus Material | N/A |
| Context | Context required |
| Recommended Response Mechanisms | N/A |
| Construct-Relevant Vocabulary | N/A |
| Cognitive Complexity | 6 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify a true statement about a situation, given a description in words and function notation. |
| | Tier 2 The student can identify the function notation equation that represents a given situation. |
| | Tier 3 The student can use function notation to answer questions about a given situation. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photos, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 2

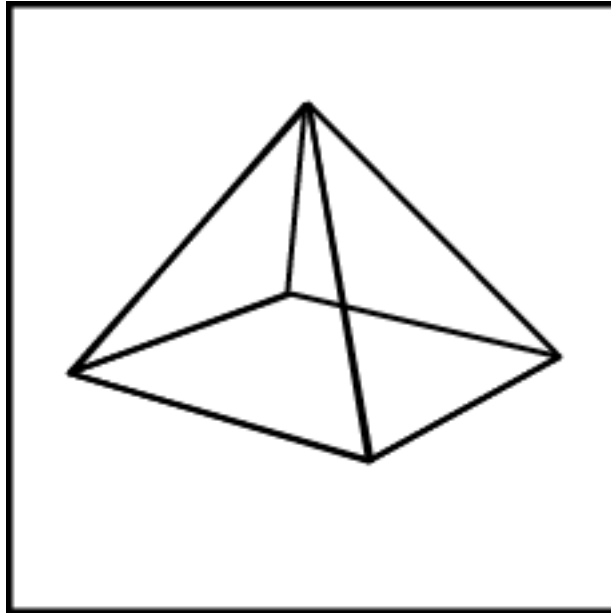
A book store gives \$3 discount to students who buy the new math book. If x denote price of the book and $P(x)$ is the amount that students pay, which equation match this situation?

- A. $P(x) = x + 4$
- B. $P(x) = x - 4$
- C. $P(x) = -4$

| | |
|---|--|
| Reporting Category | Geometry and Measurement |
| Content Connector | MA10.GM.1.a.1: Identify and describe attributes of three-dimensional geometric objects. |
| IAS Standard | MA10.GM.1: Identify, define and describe attributes of three-dimensional geometric objects (right rectangular prisms, cylinders, cones, spheres, and pyramids). Explore the effects of slicing these objects using appropriate technology and describe the two-dimensional figure that results. |
| Content Limits | Include only rectangular prisms and pyramids. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | face, edge, right rectangular prism, cylinder, cone, cube, sphere, pyramid |
| Cognitive Complexity | 3 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify a specified object. |
| | Tier 2 The student can identify the parts of an object. |
| | Tier 3 The student can identify difference between multiple objects. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | graphic (required) |

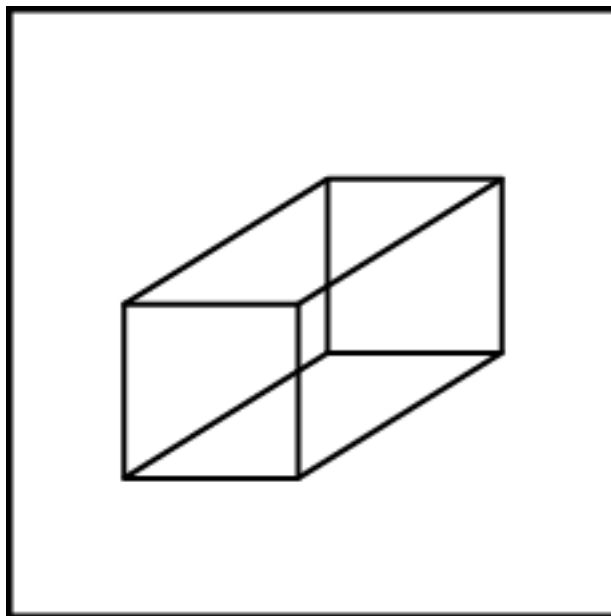
Sample Item

Which shape is a cube?



A.

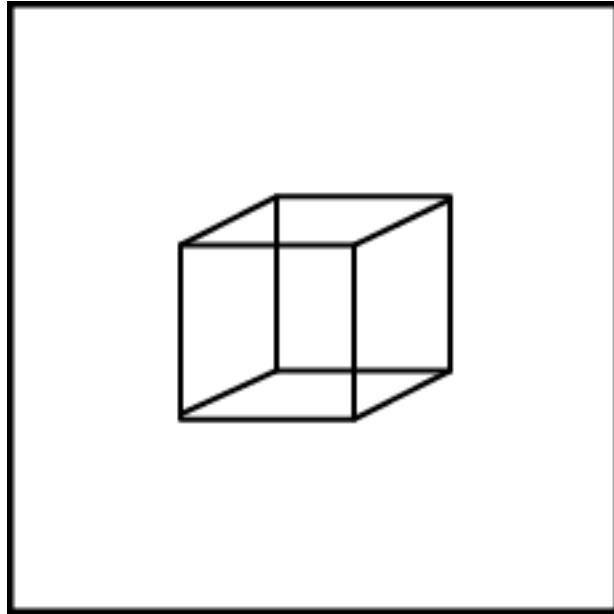
(audio: object with five faces: four triangles and a square)



B.

(audio: object with six faces: two squares and four rectangles)

Tier 1



C.

(audio: object with six faces: all equal-sized squares)

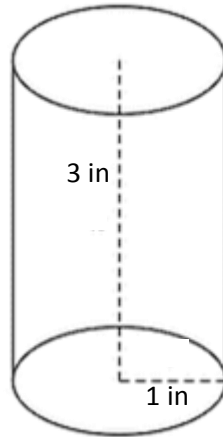
KEY

| | |
|---|--|
| Reporting Category | Geometry and Measurement |
| Content Connector | MA10.GM.2.a.1: Apply the formula to find the volume of three-dimensional shapes (e.g., cubes, spheres, and cylinders). |
| IAS Standard | MA10.GM.2: Solve real-world and other mathematical problems involving volume of cones, spheres, and pyramids and surface area of spheres. |
| Content Limits | Provide all dimensions for the formula. Formula for volume will be provided. |
| Allowable Stimulus Material | N/A |
| Context | Context allowable |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | prism, cylinder, sphere |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify the volume of a rectangular prism. |
| | Tier 2 The student can identify the volume of a cylinder. |
| | Tier 3 The student can identify the volume of a sphere. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | graphic (required) |

Sample Item

Tier 2

Here is a cylinder.



The volume of a cylinder is equal to π multiplied by the radius to the second power multiplied by the height.

$$V = \pi \cdot r^2 \cdot h$$

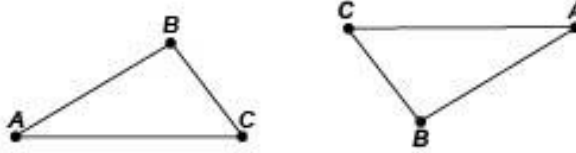
What is the volume of this cylinder?

- A. 3π
- B. 4π
- C. 5π

| | |
|---|--|
| Reporting Category | Geometry and Measurement |
| Content Connector | MA10.GM.3.a.1: Describe a sequence of transformations between two congruent figures. |
| IAS Standard | MA10.GM.3: Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations. Describe a sequence that exhibits the congruence between two given congruent figures. |
| Content Limits | No more than two transformations. No dilations (can be used as distractor). Shapes with more than one transformation should be shown on a coordinate grid. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | translation, rotation, reflection, dilation |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify a single translation. |
| | Tier 2 The student can perform a single rotation or reflection. |
| | Tier 3 The student can identify a sequence of transformations. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 3



What two transformations occurred between ABC and $A'B'C'$?

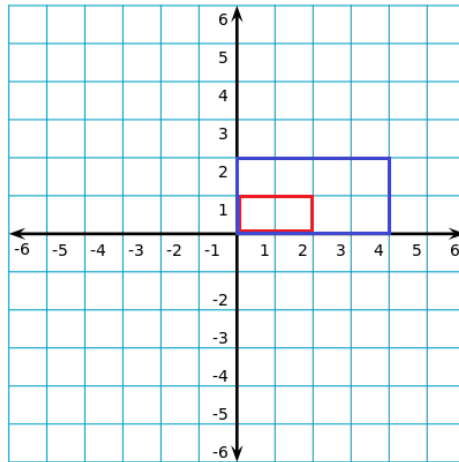
- A. dilation and rotation
- B. reflection and translation
- C. rotation and translation**

| | |
|---|--|
| Reporting Category | Geometry and Measurement |
| Content Connector | MA10.GM.4.a.1: Describe the effects of transformations on the coordinates of a figure. |
| IAS Standard | MA10.GM.4: Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. |
| Content Limits | No rotations. Reflections limited to over an axis. All shapes should be shown on a coordinate grid. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | rotation, reflection, translation, dilation, congruent, similar, coordinate |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify the result of a transformation. |
| | Tier 2 The student can identify the transformation that occurred between figures. |
| | Tier 3 The student can identify a new coordinate based on the transformation. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 2

Here is a graph showing a red rectangle and a blue rectangle.



Which transformation makes the red rectangle match the blue rectangle?

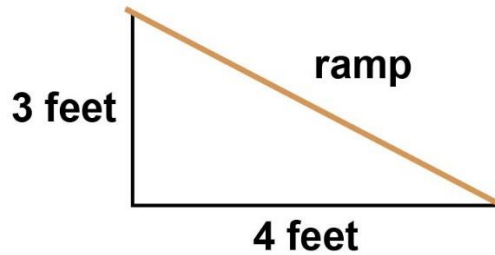
- A. translation
- B. reflection
- C. dilation**

| | |
|---|--|
| Reporting Category | Geometry and Measurement |
| Content Connector | MA10.GM.5.a.1: Apply the Pythagorean Theorem to determine lengths/distances in real-world situations. |
| IAS Standard | MA10.GM.5: Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and other mathematical problems in two dimensions. |
| Content Limits | Pythagorean triples The formula for Pythagorean theorem will be provided. |
| Allowable Stimulus Material | N/A |
| Context | Context required |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | Pythagorean Theorem |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can use the Pythagorean Theorem to solve a real-world problem when provided a visual. |
| | Tier 2 The student can use the Pythagorean Theorem to solve a real-world problem when provided a visual. |
| | Tier 3 The student can use the Pythagorean Theorem to solve a real-world problem. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 1

Paul wants to know the length of a ramp.



Paul uses the Pythagorean Theorem to find the length of the ramp.

$$a^2 + b^2 = c^2$$

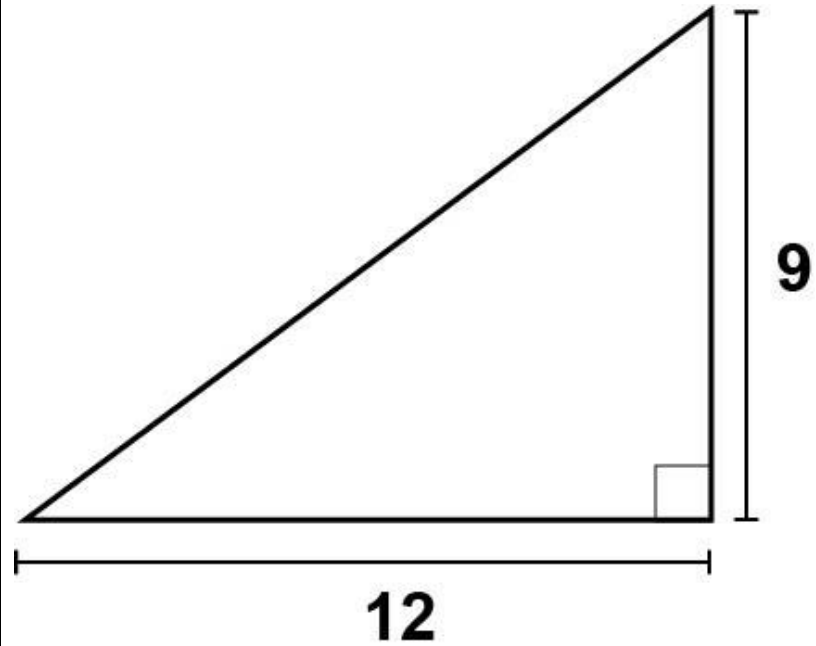
What is the length of the ramp?

- A. 3 feet
- B. 4 feet
- C. 5 feet**

| | |
|---|--|
| Reporting Category | Geometry and Measurement |
| Content Connector | MA 10.GM.5.a.2: Find the hypotenuse of a two-dimensional right triangle (Pythagorean Theorem) |
| IAS Standard | MA10.GM.5: Apply the Pythagorean Theorem to determine the unknown side lengths in right triangles in real-world and other mathematical problems in two-dimensions |
| Content Limits | Contents will be limited to integers -10 through 10. |
| Allowable Stimulus Material | Items will allow use of the coordinate plane. |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) Equation Response (EQ) |
| Construct-Relevant Vocabulary | Hypotenuse, Pythagorean Theorem |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 Student can identify the hypotenuse of a right triangle. |
| | Tier 2 Students can use a given formula to solve for the hypotenuse of a right triangle. |
| | Tier 3 Students can use a given formula to solve for the hypotenuse of a right triangle located on the coordinate plane. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Here is a triangle.



Tier 2

The squares of the two sides of a right triangle is equal to the square of the hypotenuse.

$$a^2 + b^2 = c^2$$

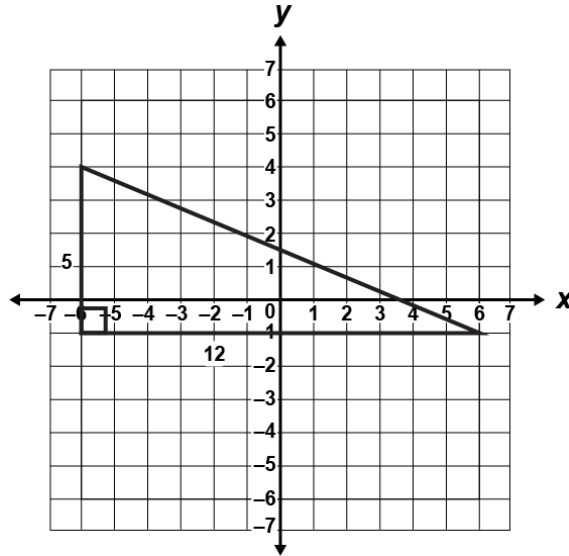
What is the length of the hypotenuse?

- A. 3
- B. 15**
- C. 21

| | |
|---|--|
| Reporting Category | Geometry and Measurement |
| Content Connector | MA10.GM.6.a.1: Apply the Pythagorean Theorem to determine lengths/distances on a coordinate plane. |
| IAS Standard | MA10.GM.6: Apply the Pythagorean Theorem to find the distance between two points in a coordinate plane. |
| Content Limits | Pythagorean triples The formula for Pythagorean theorem will be provided. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | Pythagorean Theorem |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can use the Pythagorean Theorem to solve a problem when provided a visual. |
| | Tier 2 The student can use the Pythagorean Theorem to solve a problem when provided a visual. |
| | Tier 3 The student can use the Pythagorean Theorem to solve a problem. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Here is a right triangle.



Tier 2

$$a^2 + b^2 = c^2$$

What is the length of the hypotenuse?

- A. 7
- B. 13**
- C. 17

| | |
|---|---|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.NSEC.1.a.1: Identify rational and irrational numbers. |
| IAS Standard | MA10.NSEC.1: Give examples of rational and irrational numbers and explain the difference between them. Understand that every number has a decimal expansion; for rational numbers, show that the decimal expansion terminates or repeats, and convert a decimal expansion that repeats into a rational number. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) Multiple Select (MS) |
| Construct-Relevant Vocabulary | rational, irrational |
| Cognitive Complexity | 3 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify a rational or irrational number. |
| | Tier 2 The student can identify a rational or irrational number. |
| | Tier 3 The student can identify a rational or irrational number. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

| Sample Item | |
|---------------|--|
| Tier 2 | <p>Which number is irrational?</p> <p>A. $\sqrt{25}$</p> <p>B. π</p> <p>C. $\frac{1}{3}$</p> |

| | |
|---|---|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.NSEC.1.a.2: Round irrational numbers to the hundredths place. |
| IAS Standard | MA10.NSEC.1: Give examples of rational and irrational numbers and explain the difference between them. Understand that every number has a decimal expansion; for rational numbers, show that the decimal expansion terminates or repeats, and convert a decimal expansion that repeats into a rational number. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | irrational |
| Cognitive Complexity | 3 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can round numbers to the hundredths place when given a decimal to the thousandths place. |
| | Tier 2 The student can round numbers to the hundredths place when given a decimal to the ten-thousandths place. |
| | Tier 3 The student can round irrational numbers in any form to the hundredths place. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 3

What is π , rounded to the hundredths place?

- A. 3.00
- B. 3.51
- C. 3.14**

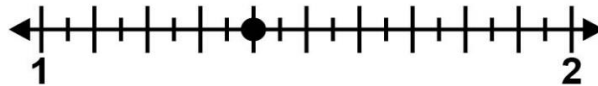
| | |
|---|--|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.NSEC.2.a.1: Use the estimate of irrational numbers to locate them on a number line. |
| IAS Standard | MA10.NSEC.2: Use rational approximations of irrational numbers to compare the size of irrational numbers, plot them approximately on a number line, and estimate the value of expressions involving irrational numbers. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | number line, estimate |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify the location of an irrational number on a number line with whole numbers increments. |
| | Tier 2 The student can identify the location of an irrational number on a number line with increments of halves. |
| | Tier 3 The student can identify the location of an irrational number on a number line with increments of tenths. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations: | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 1

Where on a number line is $\sqrt{2}$?

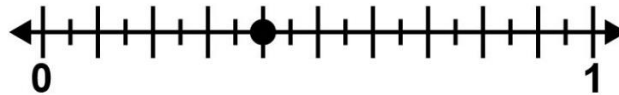
A.



(Audio: here is a number line with a range of one to two. There is a point four tenths units to the right of zero.

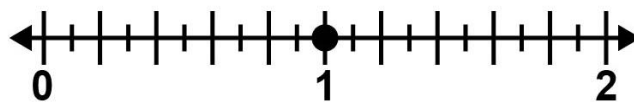
KEY

B.



(Audio: here is a number line with a range of zero to one. There is a point four tenths units to the right of zero

C.



(Audio: here is a number line with a range of zero to two. There is a point one unit to the right of zero.

| | |
|---|--|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.NSEC.3.a.1: Use properties of integer exponents to produce equivalent expressions. |
| IAS Standard | MA10.NSEC.3: Given a numeric expression with common rational number bases and integer exponents, apply the properties of exponents to generate equivalent expressions. |
| Content Limits | Tier 1 and Tier 2: Positive whole numbers only. Tier 3: Negative exponents allowable. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | expression, equivalent |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify the correct expanded form for positive exponents. |
| | Tier 2 The student can identify equivalent exponential expressions. |
| | Tier 3 The student can use the properties of integer exponents. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

| Sample Item | |
|---------------|--|
| Tier 1 | <p>Which expression is equal to 4^3?</p> <p>A. $4 \times 4 \times 4$</p> <p>B. 4×4</p> <p>C. $4 + 4 + 4$</p> |

| | |
|---|--|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.NSEC.6.a.1: Solve real-world problems with rational numbers by using two operations. |
| IAS Standard | MA10.NSEC.6: Solve real-world problems with rational numbers by using multiple operations. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | Context required |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | N/A |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify the solution to a real-world problem with two operations with integers. |
| | Tier 2 The student can identify the solution to a real-world problem with two operations with rational numbers. |
| | Tier 3 The student can identify the solution to a real-world problem with two operations with rational numbers. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

| Sample Item | |
|---------------|--|
| Tier 3 | <p>Roland has 3 apples. Kelly has 2 times as many apples as Roland. Kelly's friend gives her 4 more apples.</p> <p>How many apples does Kelly have now?</p> <p>A. 5 B. 10 C. 11</p> |

| | |
|---|--|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.NSEC.8.a.1: Simplify numeric exponential expressions in rational form. |
| IAS Standard | MA10.NSEC.8: Simplify algebraic rational expressions, with numerators and denominators containing monomial bases with integer exponents, to equivalent forms. |
| Content Limits | No powers of powers. Tier 1 and Tier 2: natural number exponents. Tier 3: integer exponents. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | equivalent, expression |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify an equivalent exponential expression in rational form. |
| | Tier 2 The student can solve an equivalent exponential expression in rational form. |
| | Tier 3 The student can solve an equivalent exponential expression in rational form. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

| Sample Item | |
|---------------|---|
| Tier 1 | <p>Which expression is equivalent to $3^2 \times 3^2$?</p> <p>A. 3^4 B. 6^2 C. 9^4</p> |

| | |
|---|--|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.NSEC.9.a.1: Use factoring to find equivalent expressions. |
| IAS Standard | MA10.NSEC.9: Factor common terms from polynomials and factor polynomials completely. Factor the difference of two squares, perfect square trinomials, and other quadratic expressions. |
| Content Limits | Focus on factoring. No rational exponents. Tier 2: either a difference of squares or pulling out a common factor. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | Equivalent, expression, factor |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify a common factor of a polynomial. |
| | Tier 2 The student can select the factors of a given polynomial. |
| | Tier 3 The student can select the factors of a given trinomial. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

| Sample Item | |
|---------------|---|
| Tier 3 | <p>Here is an expression.</p> $x^2 + 5x + 6$ <p>What are the factors of this expression?</p> <p>A. $(x + 2)(x + 3)$</p> <p>B. $(x + 1)(x + 5)$</p> <p>C. $(x + 5)(x + 6)$</p> |

| | |
|---|--|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.NSEC.10.a.1: Add and subtract polynomials. |
| IAS Standard | MA10.NSEC.10: Understand polynomials are closed under the operations of addition, subtraction, and multiplication with integers; add, subtract, and multiply polynomials and divide polynomials by monomials. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | expression (avoid: “polynomial,” “monomial,” “binomial”) |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can add and subtract degree 1 monomials. |
| | Tier 2 The student can add and subtract degree 1 binomials. |
| | Tier 3 The student can add and subtract polynomials. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

| Sample Item | |
|---------------|---|
| Tier 1 | <p>What is $2x + 7x$ equal to?</p> <p>A. $9x$ B. $14x$ C. $9x^2$</p> |

| | |
|---|--|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.NSEC.10.a.2: Multiply polynomials. |
| IAS Standard | MA10.NSEC.10: Understand polynomials are closed under the operations of addition, subtraction, and multiplication with integers; add, subtract, and multiply polynomials and divide polynomials by monomials. |
| Content Limits | One-digit integer coefficients. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | multiply, equivalent, expression (avoid “polynomial;” “monomial;” “binomial”) |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can multiply degree 1 monomials. |
| | Tier 2 The student can multiply degree 1 monomial by any binomial. |
| | Tier 3 The student can multiply polynomials. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

| Sample Item | |
|---------------|---|
| Tier 2 | <p>Here is an expression.</p> $2x(x + 3)$ <p>Which expression is equivalent to the one above?</p> <p>A. $2x^2 + 3$ B. $3x^2 + 6x$ C. $2x^2 + 6x$</p> |

| | |
|---|--|
| Reporting Category | Number Sense and Data Analysis |
| Content Connector | MA10.NSEC.10.a.3: Divide a polynomial by a monomial. |
| IAS Standard | MA10.NSEC.10: Understand polynomials are closed under the operations of addition, subtraction, and multiplication with integers; add, subtract, and multiply polynomials and divide polynomials by monomials. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | equivalent, expression (avoid “polynomial”) |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can divide degree 1 monomials. |
| | Tier 2 The student can divide a binomial by a degree 1 monomial. |
| | Tier 3 The student can divide a polynomial by a monomial. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 3

Here is an expression.

$$\frac{x^3 + 2x^2}{x}$$

Which expression is equivalent to this one?

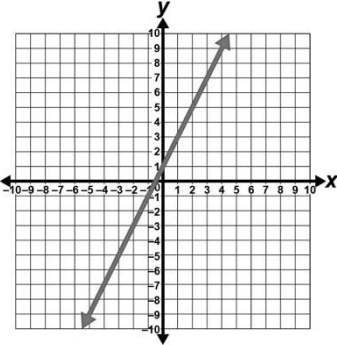
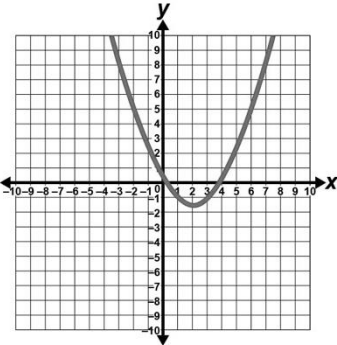
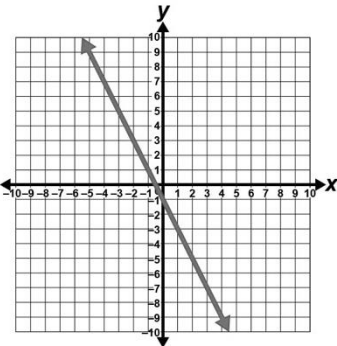
- A. $x^2 + 2x^2$
- B. $x^3 + 2x$
- C. $x^2 + 2x$

| | |
|---|---|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.QEEF.1.a.1: Given multiple graphs, describe the function as linear or not linear. |
| IAS Standard | MA10.QEEF.1: Distinguish between situations that can be modeled with linear functions and with exponential functions. Understand that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. Compare linear functions and exponential functions that model real-world situations using tables, graphs, and equations. |
| Content Limits | Non-linear functions should emphasize exponential, though quadratic functions may be included as distractors. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Table Match (TM) |
| Construct-Relevant Vocabulary | Linear |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can select a linear or non-linear function from a set of graphs. |
| | Tier 2 The student can select a linear or non-linear function from a set of graphs. |
| | Tier 3 The student can select a linear or non-linear function from a set of graphs. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Match the graph to the type of function it represents.

Tier 3

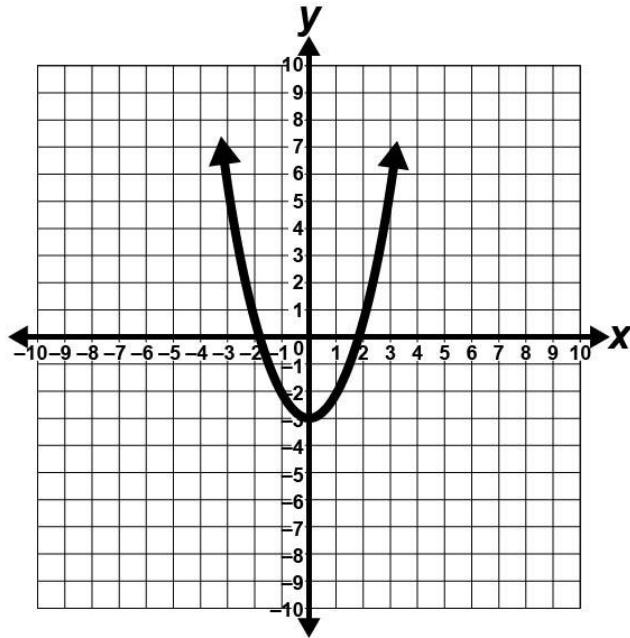
| | Linear | Non-Linear |
|---|----------|------------|
|  | X | |
|  | | X |
|  | X | |

KEY

| | |
|---|--|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.QEEF.2.a.1: Determine if points lie on a graph of an exponential or quadratic function. |
| IAS Standard | MA10.QEEF.2: Graph exponential and quadratic equations in two variables with and without technology. |
| Content Limits | All items should have a graph. Points on grid intersections. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | point, coordinate, function |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify a point that is on a quadratic or exponential function. |
| | Tier 2 The student can select a point that is on a quadratic or exponential function. |
| | Tier 3 The student can provide a point that is on a quadratic or exponential function. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Here is the graph of a quadratic function.



Tier 2

Which point lies on the graph of the function?

- A. (0, 0)
- B. (1, 1)
- C. (3, 6)

| | |
|---|--|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.QEEF.3.a.1: Solve equations using the properties of square roots. |
| IAS Standard | MA10.QEEF.3: Solve quadratic equations in one variable by inspection (e.g., for $x^2 = 49$), finding square roots, using the quadratic formula, and factoring, as appropriate to the initial form of the equation. |
| Content Limits | Perfect squares within 100. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Select (MS) Multiple Choice (MC) |
| Construct-Relevant Vocabulary | expression, equation, solution |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify the positive solution to a perfect square. |
| | Tier 2 The student can identify the positive and negative solution to a perfect square. |
| | Tier 3 The student can solve a one-step equation involving a perfect square. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 2

Here is an expression.

$$x^2$$

What value of x makes the expression equal to 25?

- A. 3
- B. -5**
- C. 6

| | |
|---|--|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.QEEF.4.a.1: Determine if points lie on a graph of a quadratic function of a real-world situation. |
| IAS Standard | MA10.QEEF.4: Represent real-world problems using quadratic equations in one or two variables and solve such problems with and without technology. Interpret the solution and determine whether it is reasonable. |
| Content Limits | All items should have a graph provided. All items should show points on grid intersections. |
| Allowable Stimulus Material | N/A |
| Context | Context required |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | point, coordinate, function |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify a point that is on a quadratic function. |
| | Tier 2 The student can select a point that is on a quadratic function. |
| | Tier 3 The student can determine the output from a given input within context. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 3

A scientist is studying a group of bacteria. He uses the formula $y = x^2$ to find how many bacteria there are after a certain number of days, where x is the number of days. Here is a table showing the number of bacteria after each day.

| x | y |
|-----|-----|
| 1 | 1 |
| 2 | 4 |
| 3 | 9 |
| 4 | 16 |
| 5 | |

What is the missing value in the table?

- A. 20
- B. 21
- C. 25**

| | |
|---|--|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.QEEF.5.a.1: Describe attributes of a quadratic function in a real-world problem. |
| IAS Standard | MA10.QEEF.5: Use and apply the process of factoring to determine zeros (x-intercepts and solutions), lines of symmetry, and extreme values in real-world and other mathematical problems involving quadratic functions; interpret the results in the real-world contexts. |
| Content Limits | Functions should have integer roots less than 10. Leading coefficients less than 10. |
| Allowable Stimulus Material | N/A |
| Context | Context required |
| Recommended Response Mechanisms | Multiple Choice (MC) Table Match (TM) |
| Construct-Relevant Vocabulary | Zeros, roots, initial value |
| Cognitive Complexity | 6 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can determine if an x-value is a zero of a function. |
| | Tier 2 The student can identify the zeros when given a factored function. |
| | Tier 3 The student can interpret the attribute of the function in terms of the context. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

| Sample Item | |
|---------------|--|
| Tier 2 | <p>Here is an equation:</p> $(x - 5)(2x + 3) = 2x^2 - 7x - 15$ <p>At which two values of x is the equation $2x^2 - 7x - 15 = 0$ true?</p> <ul style="list-style-type: none">a. -5 and $-\frac{3}{2}$b. -5 and 3c. $-\frac{3}{2}$ and 5 |

| | |
|---|---|
| Reporting Category | Functions (Linear and Non-linear) |
| Content Connector | MA10.QEEF.6.a.1: With a model, answer questions about exponential functions. |
| IAS Standard | MA10.QEEF.6: Represent real-world and other mathematical problems that can be modeled with exponential functions using tables, graphs, and equations of the form $y = ab^x$ (for integer values of $x > 1$, rational values of $b > 0$ and $b \neq 1$); translate fluently among these representations and interpret the values of a and b . |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | Context allowable |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | growth, decay |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify growth or decay. |
| | Tier 2 The student can determine an output for a given input when given a model, table, or function. |
| | Tier 3 The student can identify the rate of growth or decay of an exponential function. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 2

Complete the table for the function $f(x) = 3^x$.

| x | f(x) |
|---|------|
| 0 | 1 |
| 1 | 3 |
| 2 | 9 |
| 3 | 27 |
| 4 | |

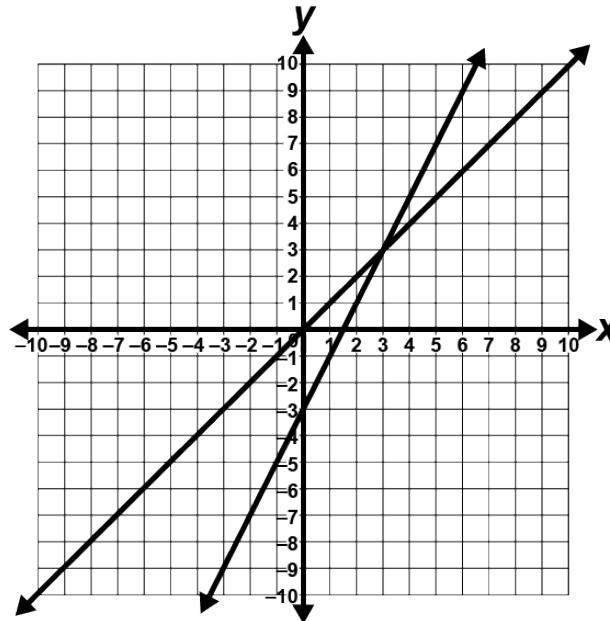
What is the missing value in the table?

- A. 30
- B. 54
- C. 81

| | |
|---|---|
| Reporting Category | Equations and Inequalities (Linear and Systems) |
| Content Connector | MA10.SEI.1.a.1: Identify the solution to a system of linear equations given a graph. |
| IAS Standard | MA10.SEI.1: Understand the relationship between a solution of a pair of linear equations in two variables and the graphs of the corresponding lines. Solve pairs of linear equations in two variables by graphing; approximate solutions when the coordinates of the solution are non-integer numbers. |
| Content Limits | Integers. Solutions must be on grid intersections. Tier 1 in quadrant 1. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | coordinate |
| Cognitive Complexity | 4 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify the coordinates where two lines cross. |
| | Tier 2 The student can identify the coordinates of the solution of two lines. |
| | Tier 3 The student can identify the coordinates of the solution of two lines, in Quadrants II, III, or IV of the coordinate plane. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Here is a graph with the lines of two equations.



Tier 3

What are the coordinates of the solution to the system?

- A. (-3,-3)
- B. (3, 3)**
- C. (3, -3)

| | |
|---------------------------------|--|
| Reporting Category | Equations and Inequalities (Linear and Systems) |
| Content Connector | MA10.SEI.2.a.1: Solve a system of linear equations. |
| IAS Standard | MA10.SEI.2: Understand that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. Solve pairs of linear equations in two variables using substitution and elimination. |
| Content Limits | Integers. Must have one and only one solution. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) Multiple Select (MS) Table Match (TM) Equation Response (EQ) |
| Construct-Relevant Vocabulary | Equations Avoid “system of linear equations.” Instead say “two equations” |
| Cognitive Complexity | 6 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can solve for one variable. |
| | Tier 2 The student can provide the coordinates for the solution to a system of linear equations in which one of the coefficients is the same. |
| | Tier 3 The student can provide the coordinates for the solution to a system of linear equations. |

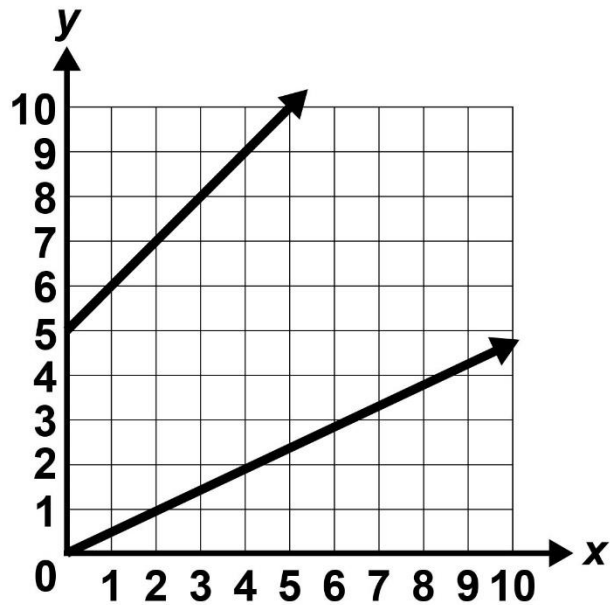
| Accessibility and Accommodation Considerations | |
|--|--|
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |
| Sample Item | |
| Tier 3 | <p>Here are two equations.</p> $y = 2x + 3$ $y = 3$ <p>What are the coordinates for the solution of these two equations?</p> <p>A. (1, 3) B. (3, 0) C. (0, 3)</p> |

| | |
|---|--|
| Reporting Category | Equations and Inequalities (Linear and Systems) |
| Content Connector | MA10.SEI.3.a.1: Choose a system of linear equations that represents a given real-world problem. |
| IAS Standard | MA10.SEI.3: Write a system of two-linear equations in two variables that represents a real-world problem and solve the problem with and without technology. Interpret the solution and determine whether the solution is reasonable. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | Context required |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | equations (avoid “system of linear equations”) (see sample) |
| Cognitive Complexity | 6 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify one of the linear equations in a system from a graph of the system. |
| | Tier 2 The student can identify the graph of a system of linear equations in slope intercept from given equations. |
| | Tier 3 The student can identify a system of linear equations from a given situation. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 1

Felipe and Kristy are running in a race. Kristy runs twice as fast as Felipe, so she gives him a head start. The graph below shows the distance they run as time passes.



The distance that Kristy runs is modeled by $y = 2x$.

What line represents the distance that Felipe runs?

- A. $y = 2x + 5$
- B. $y = x + 5$**
- C. $y = 5$

| | |
|---|--|
| Reporting Category | Equations and Inequalities (Linear and Systems) |
| Content Connector | MA10.SEI.4.a.1: Identify the solution set to a system of inequalities. |
| IAS Standard | MA10.SEI.4: Represent real-world problems using a system of two-linear inequalities in two variables and solve such problems; interpret the solution set and determine whether it is reasonable. Solve other pairs of linear inequalities by graphing with and without technology. |
| Content Limits | Integers. |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) Multiple Select (MS) Table Match (TM) Equation Response (EQ) |
| Construct-Relevant Vocabulary | Solution, inequality Avoid “system of inequalities.” Instead say “two inequalities.” |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 The student can identify an ordered pair as one of the solution given graph. |
| | Tier 2 The student can identify the graph that matches a set of inequalities. |
| | Tier 3 The student can identify a solution to a system of inequalities. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

| Sample Item | |
|---------------|---|
| Tier 3 | <p>Here are two inequalities.</p> $y > 3x - 1$ $y < 5$ <p>Which ordered pair is a solution to the two inequalities?</p> <p>A. (1, 3) B. (2, 4) C. (2, 6)</p> |

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| Reporting Category | Process Standards (aggregate reporting only) |
| Content Connector / IAS Process Standard | PS.1: Make sense of problems and persevere in solving them. Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway, rather than simply jumping into a solution attempt. They consider analogous problems and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" and "Is my answer reasonable?" They understand the approaches of others to solving complex problems and identify correspondences between different approaches. Mathematically proficient students understand how mathematical ideas interconnect and build on one another to produce a coherent whole. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | Context required |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | N/A |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 Student can identify if a solution makes sense based on the context. |
| | Tier 2 Student can identify if a solution makes sense based on the context. |
| | Tier 3 Student can identify if a solution makes sense based on the question that is being asked. |

| Accessibility and Accommodation Considerations | |
|--|--|
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |
| Sample Item | |
| Tier 3 | <p>Here is an equation.</p> $4r + 10 = 2$ <p>Is there a positive solution to the equation? If so, what is it?</p> <p>A. 2 B. 4 C. There is no positive solution.</p> |

| | |
|--|--|
| Reporting Category | Process Standards (aggregate reporting only) |
| Content Connector / IAS Process Standard | PS.2: Reason abstractly and quantitatively. Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | Context allowable |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | N/A |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 Student can convert between language and symbols. |
| | Tier 2 Student can use symbols to determine the plausibility of an answer. |
| | Tier 3 Student can reason to determine the correct steps to complete a problem. |

| Accessibility and Accommodation Considerations | |
|--|--|
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |
| Sample Item | |
| Tier 3 | <p>Terry has sixteen apples. She wants to share the apples with her friends.</p> <p>What must Terry determine to find out how many apples each friend will get?</p> <p>A. How many friends Terry has. B. How many apples Terry has. C. How many seeds each apple has.</p> |

| | |
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| Reporting Category | Process Standards (aggregate reporting only) |
| Content Connector / IAS Process Standard | <p>PS.3: Construct viable arguments and critique the reasoning of others. Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They analyze situations by breaking them into cases and recognize and use counterexamples. They organize their mathematical thinking, justify their conclusions and communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. They justify whether a given statement is true always, sometimes, or never. Mathematically proficient students participate and collaborate in a mathematics community. They listen to or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.</p> |
| Content Limits | Assess reasoning about mathematics, not about reasoning about assumptions or conclusions related to a contextual situation. A context may be included, if the emphasis is on the mathematical reasoning. |
| Allowable Stimulus Material | N/A |
| Context | Context allowable |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | N/A |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | <p>Tier 1 Student can identify an error in a solution.</p> |
| | <p>Tier 2 Student can identify and correct an error.</p> |
| | <p>Tier 3 Student can correct an error and explain why it was an error.</p> |

| Accessibility and Accommodation Considerations | |
|--|--|
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |
| Sample Item | |
| Tier 2 | <p>Here is an equation.</p> $2 \times (3 + 4)$ <p>Matt multiplies 3 by 2 and then adds 4.</p> <p>What did Matt do wrong?</p> <p>A. Matt didn't add 3 and 4 first. B. Matt didn't multiply 3 and 4 first. C. Matt didn't add 2 and 4 first.</p> |

| | |
|--|---|
| Reporting Category | Process Standards (aggregate reporting only) |
| Content Connector / IAS Process Standard | PS.4: Model with mathematics. Mathematically proficient students apply the mathematics they know to solve problems arising in everyday life, society, and the workplace using a variety of appropriate strategies. They create and use a variety of representations to solve problems and to organize and communicate mathematical ideas. Mathematically proficient students apply what they know and are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | Context required |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | N/A |
| Cognitive Complexity | 6 |
| Evidence Statements | |
| Evidence Statements | Tier 1 Student can identify an operation needed to complete a real-world problem. |
| | Tier 2 Student can identify all steps to solve a real-world problem. |
| | Tier 3 Student can solve a multi-step real-world problem. |

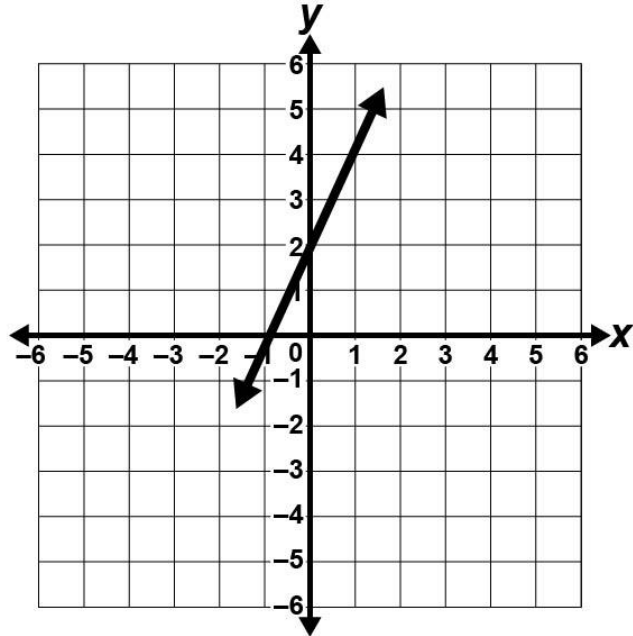
| Accessibility and Accommodation Considerations | |
|--|--|
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |
| Sample Item | |
| Tier 3 | <p>Sean wants to buy 2 movie tickets. The tickets cost \$8.50 each. Sean has 2 \$10.00 bills.</p> <p>How much change does Sean get back?</p> <p>A. \$1.50 B. \$3.00 C. \$4.50</p> |

| | |
|---|--|
| Reporting Category | Process Standards (aggregate reporting only) |
| Content Connector / IAS Process Standard | PS.5: Use appropriate tools strategically. Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Mathematically proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. Mathematically proficient students identify relevant external mathematical resources, such as digital content, and use them to pose or solve problems. They use technological tools to explore and deepen their understanding of concepts and to support the development of learning mathematics. They use technology to contribute to concept development, simulation, representation, reasoning, communication and problem solving. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | Context allowable |
| Recommended Response Mechanisms | Multiple Choice (MC) |
| Construct-Relevant Vocabulary | ruler, protractor, calculator, scale, spreadsheet, thermometer |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 Student can select and use the appropriate tool. |
| | Tier 2 Student can use technology to solve problems. |
| | Tier 3 Student can use technology to solve problems. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 1

Here is the graph of a line.



What tool is best used to determine the slope of the line?

- A. protractor
- B. calculator**
- C. ruler

| | |
|---|--|
| Reporting Category | Process Standards (aggregate reporting only) |
| Content Connector / IAS Process Standard | PS.6: Attend to precision. Mathematically proficient students communicate precisely to others. They use clear definitions, including correct mathematical language, in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They express solutions clearly and logically by using the appropriate mathematical terms and notation. They specify units of measure and label axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently and check the validity of their results in the context of the problem. They express numerical answers with a degree of precision appropriate for the problem context. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | Context allowable |
| Recommended Response Mechanisms | Multiple Choice (MC) Equation Response (EQ) |
| Construct-Relevant Vocabulary | N/A |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 Student can use correct mathematical terminology. |
| | Tier 2 Student can identify the appropriate unit. |
| | Tier 3 Student can determine when estimation is appropriate. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

| Sample Item | |
|---------------|--|
| Tier 2 | <p>Jenny is driving across the state.</p> <p>What unit rate would best fit Jenny's trip?</p> <ul style="list-style-type: none">A. Feet per hourB. Miles per hourC. Miles per minute |

| | |
|---|--|
| Reporting Category | Process Standards (aggregate reporting only) |
| Content Connector / IAS Process Standard | PS.7: Look for and make use of structure. Mathematically proficient students look closely to discern a pattern or structure. They step back for an overview and shift perspective. They recognize and use properties of operations and equality. They organize and classify geometric shapes based on their attributes. They see expressions, equations, and geometric figures as single objects or as being composed of several objects. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) Equation Response (EQ) |
| Construct-Relevant Vocabulary | N/A |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 Student can identify a pattern in a situation. |
| | Tier 2 Student can use a pattern to aid in their problem-solving. |
| | Tier 3 Student can use a pattern to efficiently solve a problem. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |

Sample Item

Tier 2

Here is a table.

| x | y |
|-----|-----|
| 1 | 2 |
| 2 | 3 |
| 3 | 4 |
| 4 | 5 |
| ? | 6 |

What is the missing value in the table?

- A. 4
- B. 5**
- C. 6

| | |
|---|--|
| Reporting Category | Process Standards (aggregate reporting only) |
| Content Connector / IAS Process Standard | PS.8: Look for and express regularity in repeated reasoning. Mathematically proficient students notice if calculations are repeated and look for general methods and shortcuts. They notice regularity in mathematical problems and their work to create a rule or formula. Mathematically proficient students maintain oversight of the process, while attending to the details as they solve a problem. They continually evaluate the reasonableness of their intermediate results. |
| Content Limits | N/A |
| Allowable Stimulus Material | N/A |
| Context | No context |
| Recommended Response Mechanisms | Multiple Choice (MC) Equation Response (EQ) |
| Construct-Relevant Vocabulary | N/A |
| Cognitive Complexity | 5 |
| Evidence Statements | |
| Evidence Statements | Tier 1 Student can recognize a pattern. |
| | Tier 2 Student can complete a pattern to find a solution. |
| | Tier 3 Student can determine the reasonableness of a pattern. |
| Accessibility and Accommodation Considerations | |
| Stimulus Graphic Limitations | Stimulus graphics will be limited to clear photo, illustrations, diagrams, tables, and charts that directly relate to the passage topic. Information contained within stimulus graphics is ineligible for assessment unless specifically prescribed by Content Connector and/or evidence statements. |
| Linguistic Complexity | To be determined after IDOE review |
| Reference Tools | N/A |
| Sample Item | |
| Tier 1 | Which is a repeating pattern? A. ABABAB B. ABCBCE C. ACBEBA |