THIRD SPACE LEARNING

8th Grade Arizona State Practice Math Test

Arizona Practice Test Grade 8

Grade 8

Questions

Name: ..... Class: .....

Date: ..... Score: .....

Session 1:
20 Questions

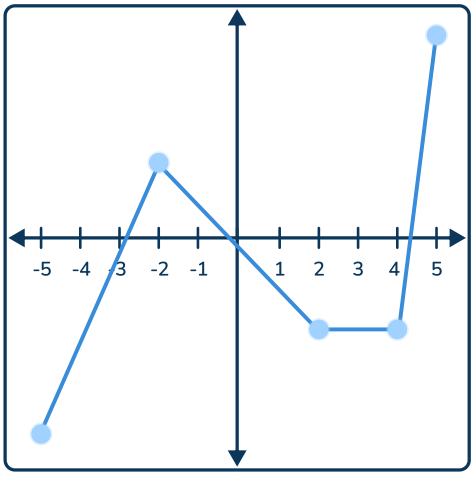
Standard: 8.G.B.8
DOK 2

1 The points A(-1, 2) and B(3, -8) are plotted on the coordinate plane. What is the distance between the points?

A. $\sqrt{116}$
B. 116
C. $\sqrt{14}$
D. $\sqrt{6}$

Standard: 8.F.B.5
DOK 3

2 The graph below shows y as a function of x. For each interval in the table, indicate whether the function is increasing, decreasing, or neither increasing nor decreasing over the interval.



In the table, check off the correct box.

Interval	Increasing	Decreasing	Neither increasing nor decreasing
$-5 < x < -2$			
$-2 < x < 2$			
$2 < x < 4$			

Answer

Standard: 8.EE.B.6
DOK 2

3 The equation of a line is given below:

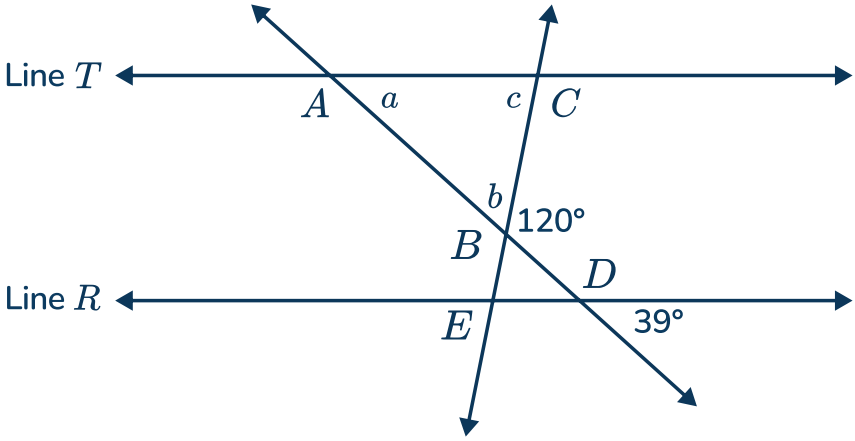
$y = \frac{1}{5}x + 1$

Write the equation of a line that has the same slope with a y-intercept of -7.
Use the space below to write your answer.

Answer

Standard: 8.G.A.4, 8.G.A.5
DOK 2

4 Line T and Line R are parallel lines, cut by two transversals.



What interior angles make up the triangle ABC?

Answer

Standard: 8.EE.A.2
DOK 2

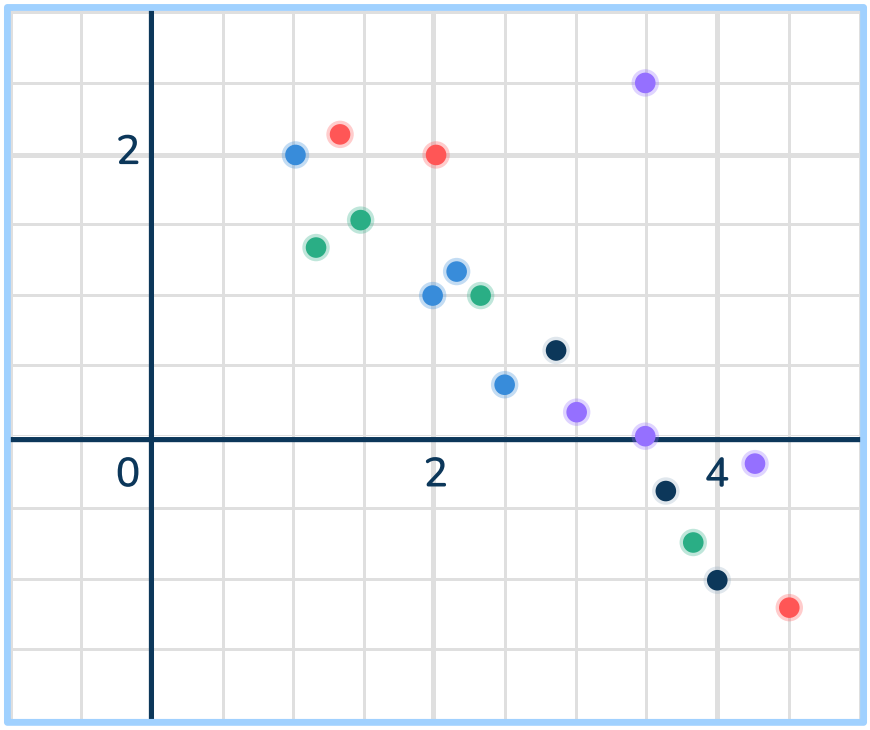
5 Find the solutions to the equation. Select all that apply.

$$x^2 = 36$$

A. 18
B. 6
C. -18
D. 36
E. -6

Standard: 8.SP.A.1
DOK 1

6 The graph below is a scatter plot. Which statement about the scatter plot is **NOT** true?



A. In general, x and y have a negative association
B. The relationship between x and y looks linear.
C. There appears to be 1 outlier.
D. The line of best fit will have a positive slope.

Standard: 8.EE.A.4
DOK 2

7 The diameter of Earth is about 1.3×10^4 and the diameter of Jupiter is about 1.4×10^5. How many times larger is the diameter of Jupiter?

A. 0.108×10^1
B. 1.08×10^1
C. 0.108×10^2
D. 1.08×10^2

Answer

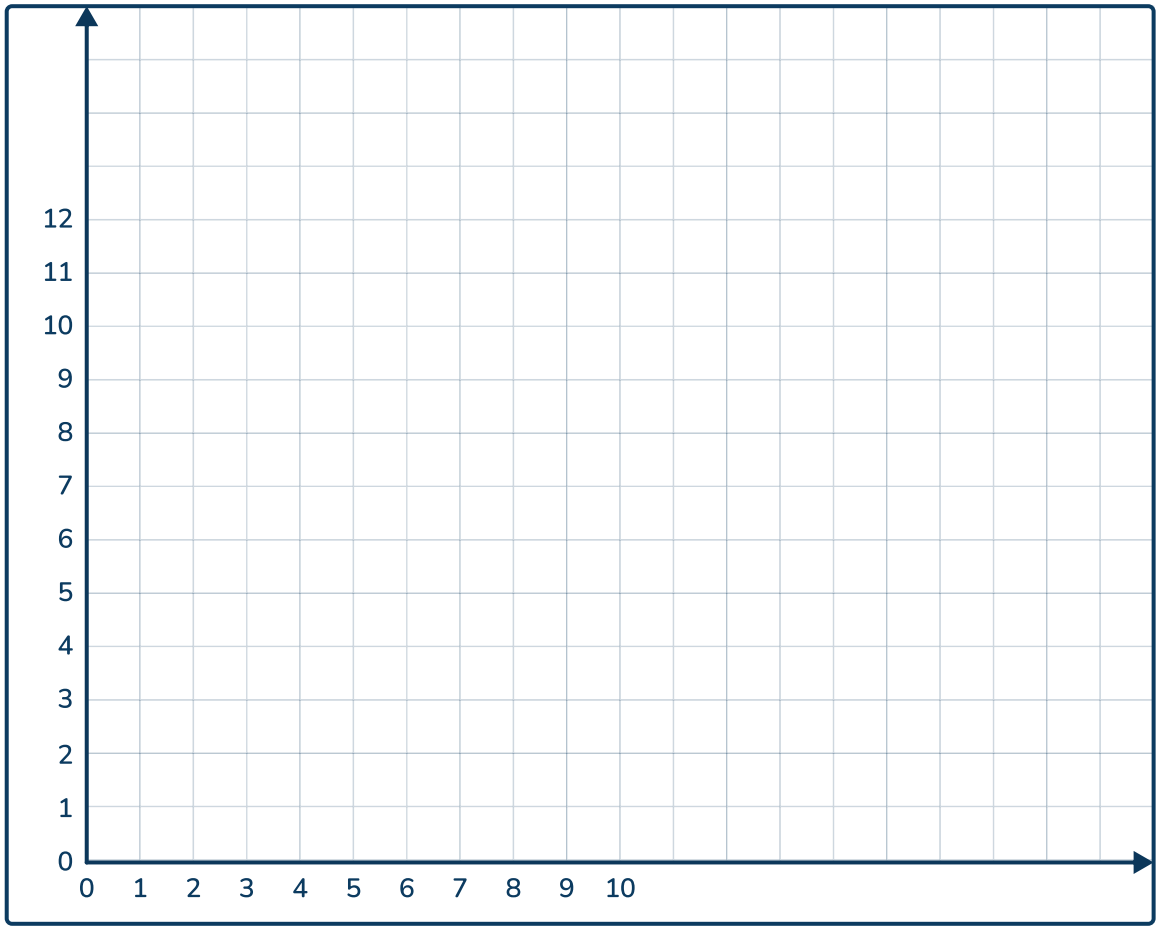
Standard: 8.F.A.3
DOK 2

8 Check off the correct classification for each equation:

	$y = x^3 - 4$	$-x + \frac{1}{2}y = -9$	$2x^2 = y$	$\sqrt{9} = y$	$x = -\frac{3}{4}$	$y = \sqrt{x}$
Linear						
Non-Linear						

Standard: 8.EE.B.5
DOK 3

9 The number of cans a machine fills is proportional to the number of minutes the machine operates. The machine fills 320 cans every 40 minutes. Write and graph an equation that shows the number of bottles, y, the machine fills in x minutes.



Standard: 8.NS.A.3
DOK 2

10 In the table below, determine whether b could be rational, irrational or cannot be determined. Check all that apply

Inequality	Rational	Irrational	Cannot determine
$-19 < b < 0$			
$-\Pi < b < -\sqrt{7}$			
$\frac{2}{3} < b < \frac{15}{4}$			

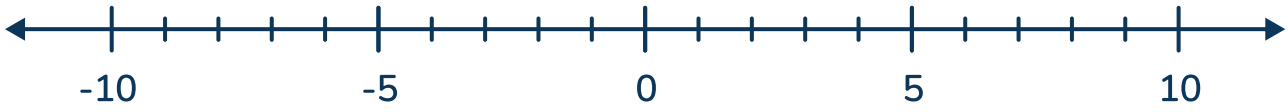
Standard: 8.G.A.3
DOK 2

11 If point A (9, 3) is reflected over the x-axis and then translated 3 units up and 4 units left, what are the coordinates of the final image?
Enter your answer in the box below.

Answer

Standard: 8.NS.A.2
DOK 2

12 Place a point on the number line that is the best approximation of $\sqrt{10}$?



Standard: 8.EE.C.7
DOK 2

13 Three equations are given. Determine if they have one solution, no solution, or infinite solutions.

Equation	One solution	No solution	Infinite solutions
$6x - 12 = -3(-2x + 4)$			
$-4(x + 1) = -4x - 9$			
$3(x - 1) + 4 = 2(x + 5)$			

Standard: 8.EE.A.2
DOK 1

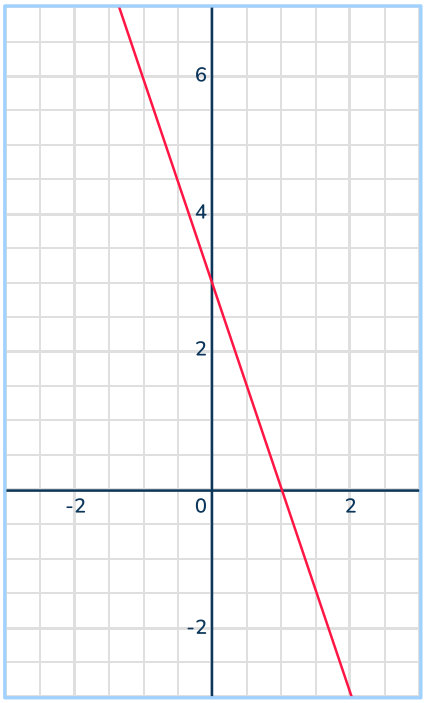
14 Solve the equation for p. Place your answer in the space provided.

$$\sqrt[3]{p} = 8$$

Value of p = _____

Standard: 8.F.A.3
DOK 2

15 Write the equation of the line in $y = mx + b$ form that is represented by the graph below.



Place your answer in the space below.

Equation of the line.

Answer

Standard: 8.F.B.4
DOK 2

16 Use the table below to answer the question.

Hours worked, x	Total amount of money charged, y
0	$80
1	$105
3	$155
5	$205

Gina runs her family's home repair service. The table above shows the service charges for the amount of hours worked. Which linear equation represents the information in the table?

A. $y = 25x$
B. $y = 25x - 80$
C. $y = 25x + 80$
D. $y = -25x - 80$

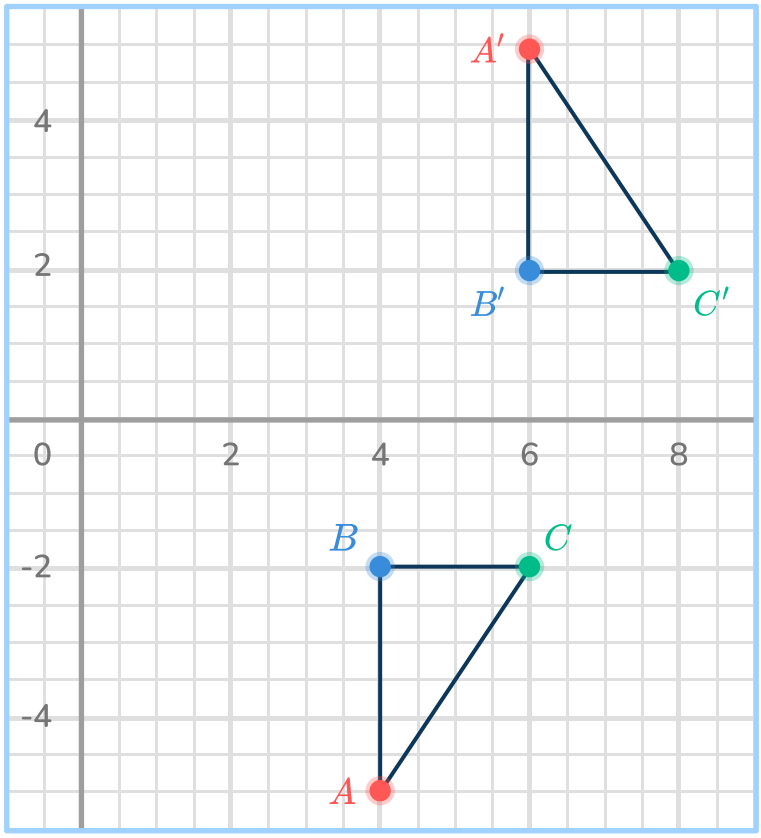
Standard: 8.G.C.9
DOK 1

17 A water bottle is in the shape of a cylinder that has a diameter of 4 inches and a height of 9 inches. Which equation can be used to find the volume of the water bottle in cubic inches?

A. $V = \Pi(2)^2(9)$
B. $V = \Pi(4)^2(9)$
C. $V = \Pi(2)^3(9)$
D. $V = \Pi(4)^3(9)$

Standard: 8.G.A.3
DOK 3

18 What is a possible sequence of transformations that maps triangle ABC to triangle A'B'C'?



Use the space below to write your answer:

Answer

Standard: 8.G.C.9
DOK 3

19 The figure below shows a right circular cylinder and a right circular cone. The cylinder and the cone have the same base and the same height.

What is the ratio of the cone's volume to the cylinder's volume? Write your answer in the space below.

Answer

Standard: 8.EE.C.8
DOK 2

20 Find the point of intersection of the two lines represented by:

$y = 2x - 4$

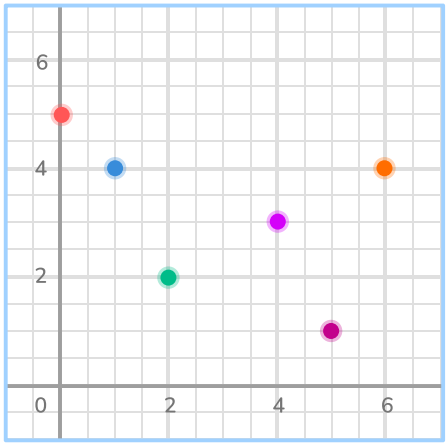
$y = -2x + 4$

Session 2:
15 Questions

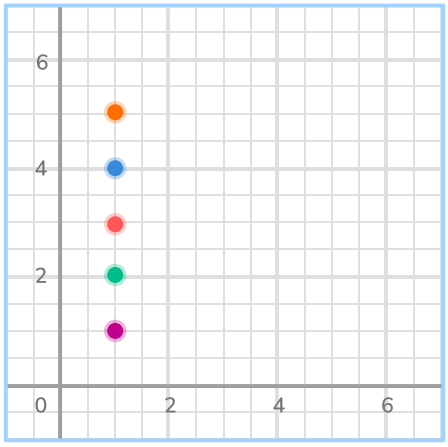
Standard: 8.F.A.1
DOK 1

1 Select all the graphs that represent a function.

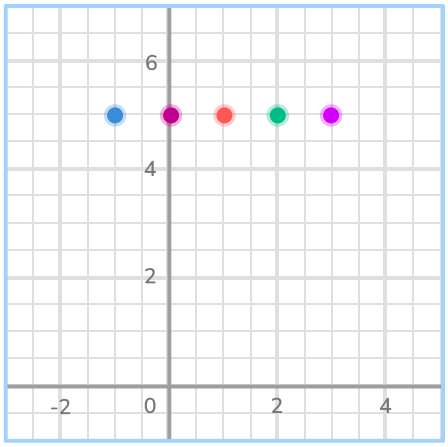
A.



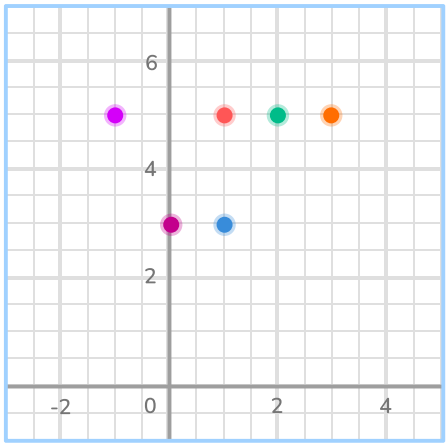
B.



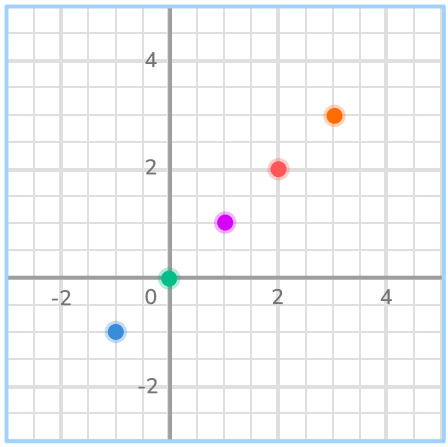
C.



D.

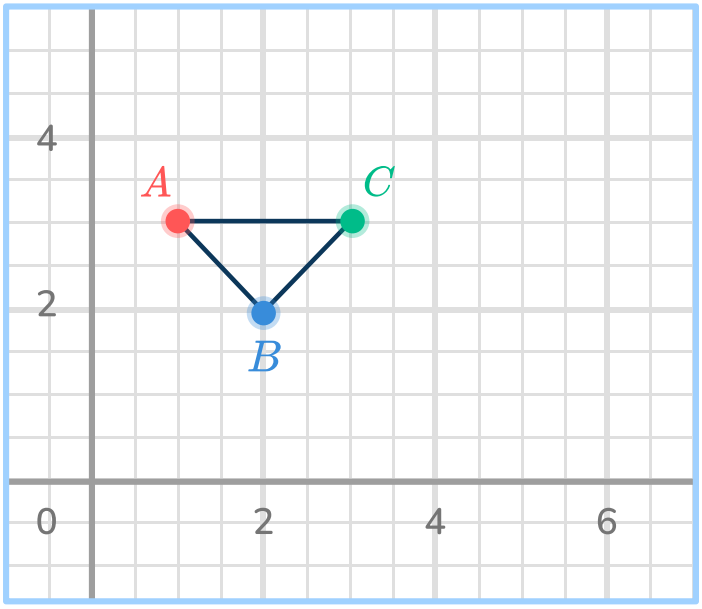


E.



Standard: 8.G.A.3
DOK 3

2 Triangle ABC is reflected over the line $y = 1$. Find the coordinates of the image, triangle A'B'C'.



Use the space below to write your answer.

Answer

Standard: 8.EE.C.7
DOK 2

3 What value for k will make the equation have no solution?

$$12x - 26 + 2 = k(3x - 9)$$

A. 2
B. 4
C. 6
D. 8

Standard: 8.EE.A.1
DOK 1

4 Which expression is equivalent to $5^{-6} \times 5^{-2}$?

A. $\frac{1}{5^{12}}$
B. $\frac{1}{5^{8}}$
C. 5^{8}
D. 5^{12}

Standard: 8.F.B.4, 8.F.A.2
DOK 2

5 Function A is represented by an equation, and Function B is represented by a table.
Based on the given information, answer the following questions.

Function A: $\frac{1}{2}x + 50$
Function B:

x	0	2	4	6
y	44	46	48	50

Which function has a greater rate of change? Use the space below to explain your answer.

Answer

Standard: 8.F.B.4
DOK 2

6 Daniella runs her own tutoring business. Due to the fact that gas prices are on the rise, Daniella charges all of her customers a $5.00 fee plus $60 an hour. If this represents a linear relationship, write a function of x that models the situation.

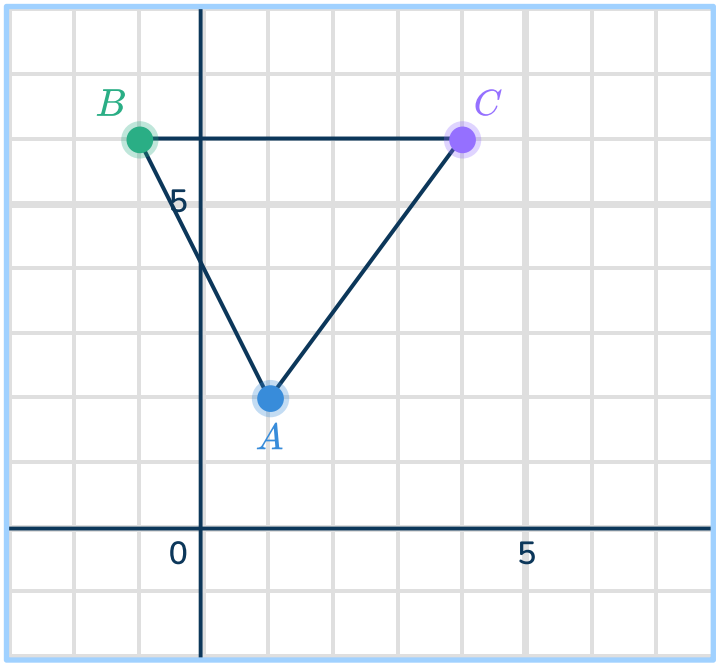
Write your answer in the space below.

Answer

Standard: 8.G.A.3

DOK 1

7 Triangle ABC is plotted on the coordinate plane. If triangle ABC is dilated by a scale factor of $\frac{1}{2}$ about the origin, what is the coordinate of A'?



A. A' (2, 3)

B. A' ($\frac{1}{2}$, 1)

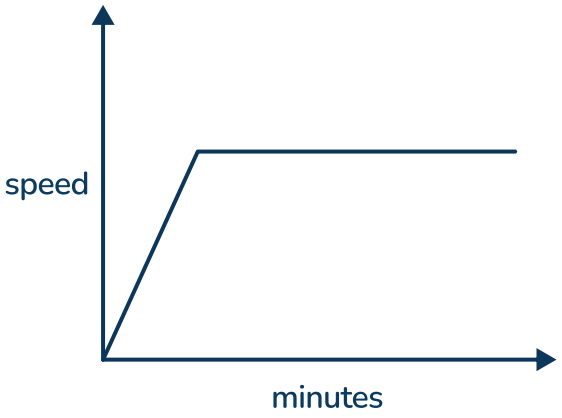
C. A' (-$\frac{1}{2}$, 3)

D. A' (2,4)

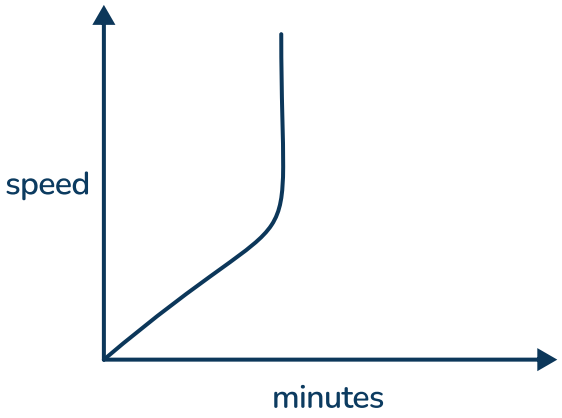
Standard: 8.F.B.5
DOK 2

8 The speed of a car was measured in minutes. It was parked and then immediately began to increase its speed. The speed continued to increase for a few minutes, and then the speed stayed the same for the rest of the time. Which is a graph of the function described above?

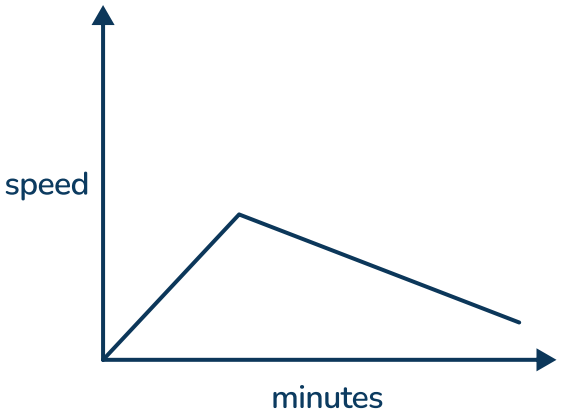
A.



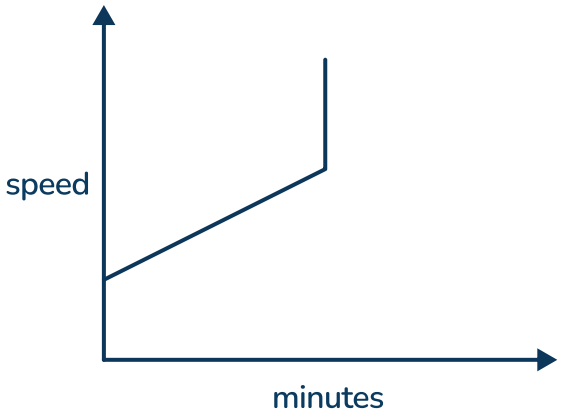
B.



C.



D.



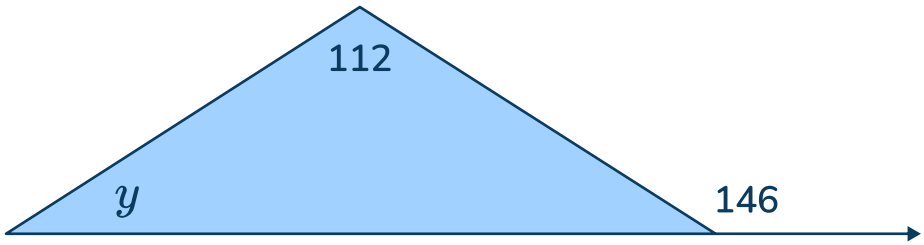
Standard: 8.SP.A.2
DOK 2

9 Which is the best statement to describe the data in a scatter plot where the y - values are increasing as the x - values are decreasing?

A. The data can be modeled by a horizontal line.
B. The data cannot be modeled by a line.
C. The data can be modeled by a line with a negative slope.
D. The data can be modeled by a line with a positive slope.

Standard: 8.G.A.5
DOK 1

10 Find the value of y.



Use the space below to write your answer.

Answer

Standard: 8.EE.C.7
DOK 3

11 Jumel and Ashley have two of the most popular phones on the market, an Android and an iPhone. The cost of both monthly cell phone plans are described below:

Jumel's Plan: A monthly fee of $60, in addition to $0.05 per text message sent, after 20 texts.
Ashley's Plan: A monthly fee of $45, in addition to $0.35 per text message sent.

Write two equations one to represent Jumel's Plan and one to represent Ashley's Plan.
Let c represent the total cost and t represent the number of texts.

Standard: 8.F.B.5

DOK 3

12 Between which two values for x is the function nonlinear and decreasing?

A. Between -3 and -2

B. Between -2 and 0

C. Between 0 and 3

D. Between 0 and 10

Standard: 8.G.B.7
DOK 3

13 Johanna is building a fence around her garden. She has 27 feet of fencing to enclose the right triangle shaped garden. If the two shorter sides of the triangular shaped garden are both 8 feet, calculate if she will have enough fencing.

Show your work in the space below.

Answer

Standard: 8.G.B.8
DOK 2

14 Two boxes are in the shape of rectangular prisms that were stored in a truck. The dimensions of each box are:

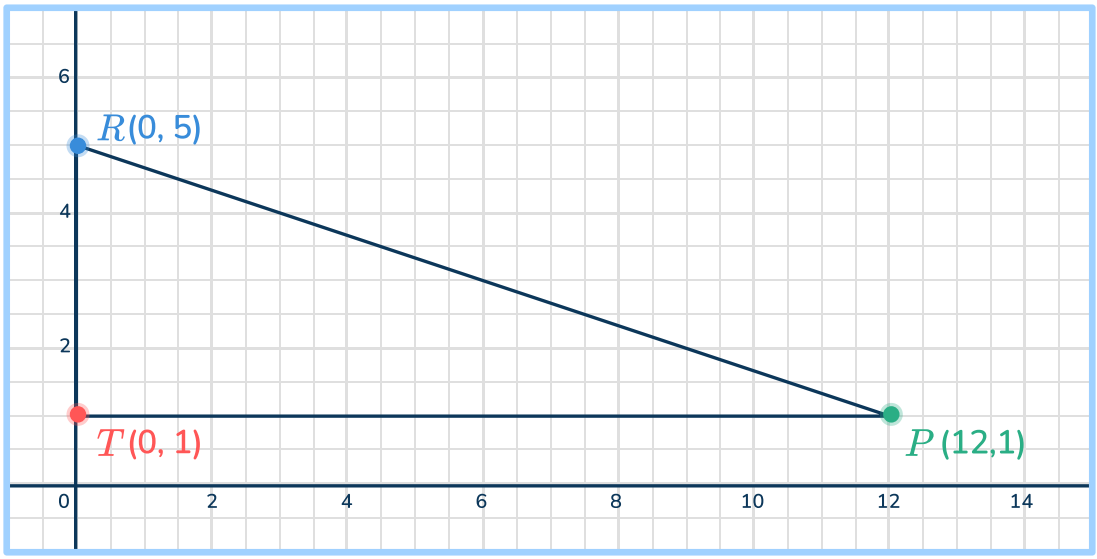
- Box 1 has a height of 2.4 feet, a width of 6.7 feet and a height of 10.2 feet.
- Box 2 has a height of 5.5 feet, a width of 3.2 feet and a height of 11.2 feet.

What is the difference in volume between the two boxes?

A. 33 in^3
B. 32.10 in^3
C. 33.104 in^3
D. 32.104 in^3

Standard: 8.G.A.3, 8.G.B.8
DOK 3

15



If the triangle is dilated by $\frac{3}{4}$, what is the distance from R' to P'?

Which strategies lead to the correct answer? Select all that apply.

A. Calculate $\sqrt{4^2 + 12^2}$, and multiply the positive root by $\frac{3}{4}$.

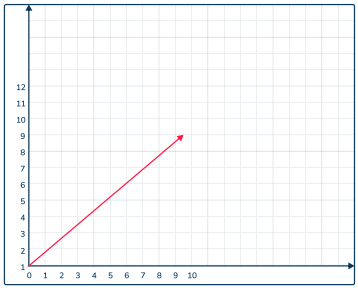
B. Multiply each coordinate by $\frac{3}{4}$ and then find the perimeter of the new triangle.

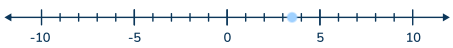
C. Calculate the square root of $5^2 + 12^2$ and multiply the positive root by $\frac{3}{4}$.

D. Shift each vertex of the triangle down $\frac{3}{4}$ units, then count the units from R' to P'.

E. Multiply (0,5) and (12,1) by $\frac{3}{4}$ and then calculate the positive root of $\sqrt{4^2 + 12^2}$.

Answer Key

Answer Key			
Session 1			
Item number	Correct answer	Standard(s)	DOK
1	A	**8.G.B.8**	DOK 2
2	Increase Decrease Neither	**8.F.B.5**	DOK 3
3	$y = \frac{1}{5}x$ -7	**8.EE.B.6**	DOK 2
4	a = 39 degrees b = 60 degrees c = 81 degrees	**8.G.A.4** **8.G.A.5**	DOK 2
5	B, E	**8.EE.A.2**	DOK 2
6	D	**8.SP.A.1**	DOK 1
7	B	**8.EE.A.4**	DOK 2
8	$y = x^3 - 4$ nonlinear $-x + 12y = -9$ linear $2x^2 = y$ nonlinear $\sqrt{9} = y$ linear $x = -\frac{3}{4}$ linear $y = \sqrt{x}$ nonlinear	**8.F.A.3**	DOK 2
9	$y = 8x$ 	**8.EE.B.5**	DOK 3

Answer Key			
Session 1			
Item number	Correct answer	Standard(s)	DOK
10	\$1-19 < b < 0: b can be rational or irrational $-\Pi < b < -\sqrt{7}$: b can be rational or irrational $\frac{2}{3} < b < \frac{15}{4}$: b can be rational or irrational	**8.NS.A.3**	DOK 2
11	(5, 0)	**8.G.A.3**	DOK 2
12	 Between 3 and 4	**8.NS.A.2**	DOK 2
13	$6x - 12 = -3(-2x + 4)$ infinite solutions $-4(x + 1) = -4x - 9$ no solution $3(x - 1) + 4 = 2(x + 5)$ one solution	**8.EE.C.7**	DOK 2
14	512	**8.EE.A.2**	DOK 1
15	$y = -3x + 3$	**8.F.A.3**	DOK 2
16	C	**8.F.B.4**	DOK 2
17	A	**8.G.C.9**	DOK 1
18	Reflect over the x- axis and then translate 2 units right	**8.G.A.3**	DOK 3
19	$\frac{1}{3}$	**8.G.C.9**	DOK 3
20	(2, 0)	**8.EE.C.8**	DOK 2

Answer Key			
Session 2			
Item number	Correct answer	Standard(s)	DOK
1	A, C, E	**8.F.A.1**	DOK 1
2	A' (1, -1) B' (2, 0) C' (3, -1)	**8.G.A.3**	DOK 3
3	B	**8.EE.C.7**	DOK 2
4	B	**8.EE.A.1**	DOK 1
5	Function B has a greater rate of change	**8.F.B.4, 8.F.A.2**	DOK 2
6	$y = 60x + 5$	**8.F.B.4**	DOK 2
7	B	**8.G.A.3**	DOK 1
8	A	**8.F.B.5**	DOK 2
9	C	**8.SP.A.2**	DOK 2
10	y = 34	**8.G.A.5**	DOK 1
11	Jumel: $60 + 0.05t = c$ for $t > 20$ Ashley: $45 + 0.35t = c$	**8.EE.C.7**	DOK 3
12	C	**8.F.B.5**	DOK 3

Answer Key			
Session 2			
Item number	Correct answer	Standard(s)	DOK
13	$8^2 + 8^2 = x^2$ $64 + 64 = x^2$ $128 = x^2$ $11.3 = x$ The triangular garden has a perimeter of 8 + 8 + 11.3 = 27.3 If Johanna only has 27 feet of fencing she will not have enough to enclose the triangular shaped garden.	**8.G.B.7**	DOK 3
14	C	**8.G.B.8**	DOK 2
15	A, E	**8.G..A.3, 8.G.B.8**	DOK 3

Rationales

Item	Score	Rationale
1	1	The student can use the distance formula or the Pythagorean Theorem to calculate the distance between the points. $\sqrt{(-1-3)^2+(2-(-8))^2}$ $\sqrt{(-4)^2+(10)^2}$ $\sqrt{16+100}=\sqrt{116}$ Choice A
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
2	1	Increase Decrease Neither
	0	Answer is incorrect or irrelevant.

Item	Item	Rationale
3	1	The student correctly writes the equation, $y = \frac{1}{5}x$ - 7
	0	Answer is incorrect or irrelevant.

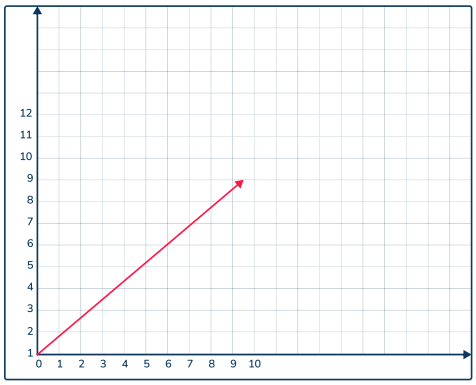
Item	Score	Rationale
4	1	Angle = 39 degrees Angle = 60 degrees Angle = 81 degrees
	0	Answer is incorrect or irrelevant.

Item	Item	Rationale
5	1	The student identifies B and E as the solutions. $x = \sqrt{36} = \pm 6$
	0	Answer is incorrect or irrelevant.

Item	Item	Rationale
6	1	The student correctly selects, D
	0	Answer is incorrect or irrelevant.

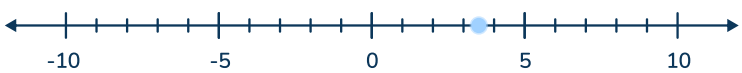
Item	Score	Rationale
7	1	The student knows to divide the values. $\frac{1.4 \times 10^5}{1.3 \times 10^4} = 1.08 \times 10^1$ Choice B
	0	Answer is incorrect or irrelevant.

Item	Item	Rationale
8	1	The student correctly identifies each function: $y = x^3 - 4$ nonlinear $-x + \frac{1}{2}y = -9$ linear $2x^2 = y$ nonlinear $\sqrt{9} = y$ linear $x = -\frac{3}{4}$ linear $y = \sqrt{x}$ nonlinear
	0	Answer is incorrect or irrelevant.

Item	Item	Rationale
9	1	The student writes the equation: $y = 8x$ 
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
10	1	The student identifies: $-19 < b < 0$: b can be rational or irrational $-\Pi < b < -\sqrt{7}$: b can be rational or irrational $\frac{2}{3} < b < \frac{15}{4}$: b can be rational or irrational
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
11	1	The student correctly identifies the point: (5, 0) (9, 3) reflected over the x-axis becomes (9, -3) (9, -3) translated 3 units up and 4 units left is, (9-4, -3+3)=(5, 0)
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
12	1	The student places a point between 3 and 4 
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
13	1	The student correctly identifies the following: $6x - 12 = -3(-2x + 4)$ infinite solutions $-4(x + 1) = -4x - 9$ no solution $3(x - 1) + 4 = 2(x + 5)$ one solution
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
14	1	The student correctly solves the equation, $\sqrt[3]{p} = 8$ $(\sqrt[3]{p})^3 = (8)^3 = 512$
	0	Answer is incorrect or irrelevant.

Item	Item	Rationale
15	1	The student correctly writes the equation, $y = -3x + 3$
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
16	1	The student calculates correctly and selects C Selecting 2 points from the table, (0,80) and (1, 105) the slope is $\frac{105 - 80}{1 - 0} = \frac{25}{1} = 25$ The y-intercept is identified as (0, 80) So the equation is $y = 25x + 80$, C
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
17	1	The student correctly identifies the formula, $V = \Pi(r^2)(h)$ The radius in this case is 2 and the height is 9. $V = \Pi(2)^2(9)$ Choice A
	0	Answer is incorrect or irrelevant.

Item	Item	Rationale
18	1	The student identifies the sequence of transformations to be: Reflect over the x-axis and then translate 2 units right
	0	Answer is incorrect or irrelevant.

Item	Item	Rationale
19	1	The student correctly identifies the ratio to be: $\frac{1}{3}$
	0	Answer is incorrect or irrelevant.

Item	Item	Rationale
20	1	The student correctly identifies the point of intersection, (2, 0)
	0	Answer is incorrect or irrelevant.

Item	Item	Rationale
1	1	The student identifies graphs A, C, and E because there is no repeat of x-coordinates with the points on those graphs.
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
2	1	The student writes the correct points. A' (1, -1) B' (2, 0) C' (3, -1)
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
3	1	The student understands that on both sides of the equation, there needs to be $12x$, so k = 4 If k = 4 then, $12x - 26 + 2 = k(3x - 9)$ $12x - 26 + 2 = 4(3x - 9)$ $12x - 24 = 12x - 36$ — no solution $-24 \neq -36$ Choice B
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
4	1	The student calculates: $5^{-6} \times 5^{-2}$ $5^{-8} = \frac{1}{5^8}$ Choice B
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
5	1	The student identifies the correct rate of change for both functions. Function A: Rate of change = $\frac{1}{2}$ Function B: $\frac{46\text{-}44}{2\text{-}0} = \frac{2}{2} = 1$ Function B has a greater rate of change
	0	Answer is incorrect or irrelevant.

Item	Item	Rationale
6	1	The student correctly writes the function. $y = 60x + 5$
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
7	1	The student multiplied the point by $\frac{1}{2}$ A (1, 2) so A' ($\frac{1}{2}$, 1) Choice B
	0	Answer is incorrect or irrelevant.

Item	Item	Rationale
8	1	The student interprets the scenario correctly and matches it to Choice A.
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
9	1	The student interprets that when the x-values decrease as the y-values increase the points will form a line that has a negative slope. Choice C
	0	Answer is incorrect or irrelevant.

Item	Item	Rationale
10	1	The student makes the correct calculation, $y + 112 = 146$ $y = 34$
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
11	1	The student writes the equations: Jumel: $60 + 0.05t = c$ for $t > 20$ Ashley: $45 + 0.35t = c$
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
12	1	The student interprets the graph correctly. From the graph, the only part that is nonlinear (not a straight line) is from 0 to 3. It's also the only part of the graph that is decreasing. Choice C
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
13	1	The student correctly does the calculations. $8^2 + 8^2 = x^2$ $64 + 64 = x^2$ $128 = x^2$ $11.3 = x$ The triangular garden has a perimeter of 8 + 8 + 11.3 = 27.3 If Johanna only has 27 feet of fencing she will not have enough to enclose the triangular shaped garden.
	0	Answer is incorrect or irrelevant.

Item	Score	Rationale
14	1	The student makes the correct calculations $V = lwh$ Box 1: 2.4 x 6.7 x 10.2 = 164.016 in³ Box 2: 5.5 x 3.2 x 11.2 = 197.12 in³ 197.12 - 164.016 = 33.104 Choice C
	0	Answer is incorrect or irrelevant.

Item	Item	Rationale
15	1	The student correctly identifies, A, and E as the answers.
	0	Answer is incorrect or irrelevant.

Breakdown of Assessment				
The Number System	Expressions, Equations, and Inequalities	Functions	Geometry	Statistics and Probability
5%	27%	27%	36%	5%

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