THIRD SPACE LEARNING

8th Grade Maryland State Practice Math Test

Maryland Practice Test Grade 8

Grade 8

Questions

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

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

1 Which equation represents the graph of a line on the coordinate plane that has an x-intercept of (4, 0) and a y-intercept of (0, 2)?

A. $y = 4x - 2$

B. $y = -4x + 2$

C. $y = -\frac{1}{2}x + 2$

D. $y = \frac{1}{2}x - 2$

2 A sphere has a diameter of 8.4 cm. What is the volume of the sphere rounded to the nearest tenth?

A. 310.3 cm^3

B. 221.7 cm^3

C. 2482.7 cm^3

D. 886.7 cm^3

3 The points C(4, -3) and D(-2, 5) are plotted on the coordinate plane. What is the distance between the points?

A. $5\sqrt{5}$
B. 10
C. 5
D. $\sqrt{10}$

---

4 What is the solution to the equation?
$-0.5(4x - 2) = 3x + 2.5$

A. $x = -3$
B. $x = 0.3$
C. $x = 3$
D. $x = -0.3$

5 Which expressions have a value of $\frac{1}{16}$? Select all the correct answers.

A. $\frac{2^2}{2^6}$

B. $(2^3)^{-2}$

C. $2^{-8} + 2^4$

D. $(2^5)^{-1}$

E. $2^{-8} \times 2^4$

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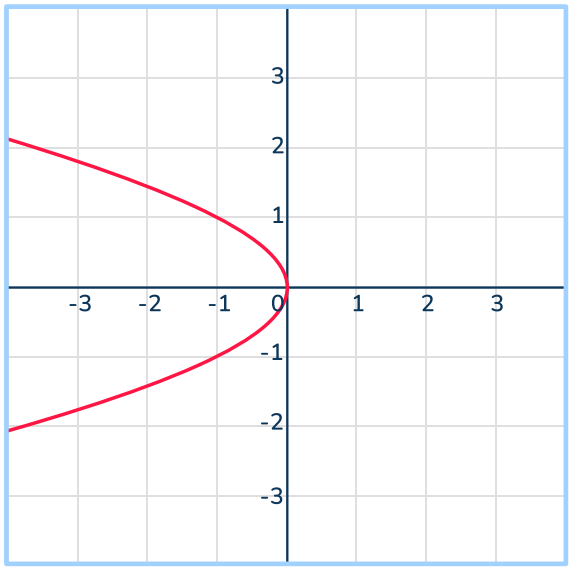
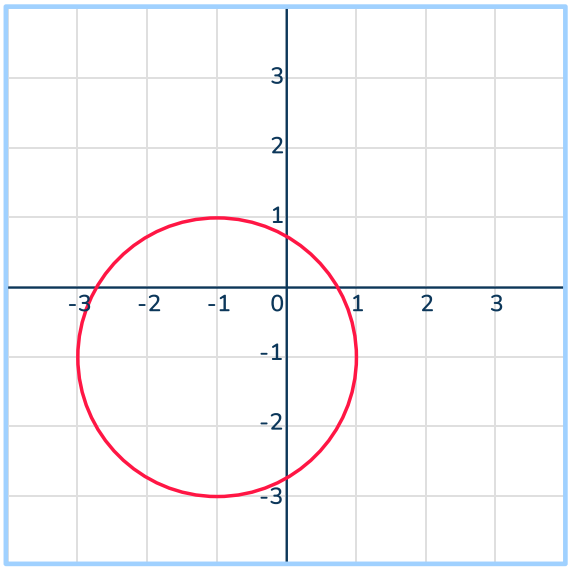
6 Which graph shows y to be a function of x?

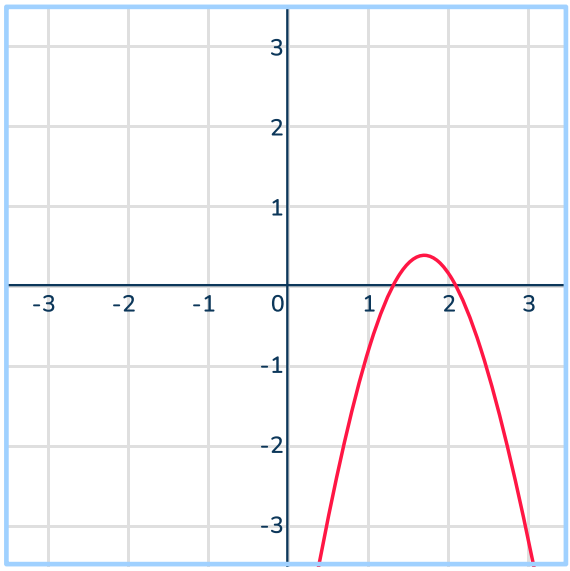
A.



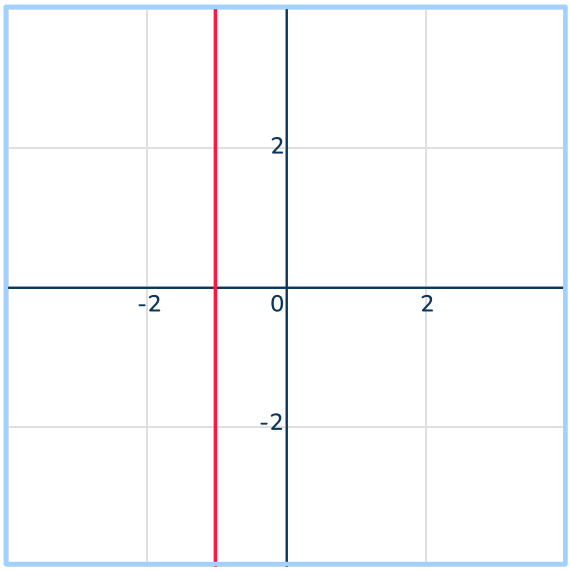
B.



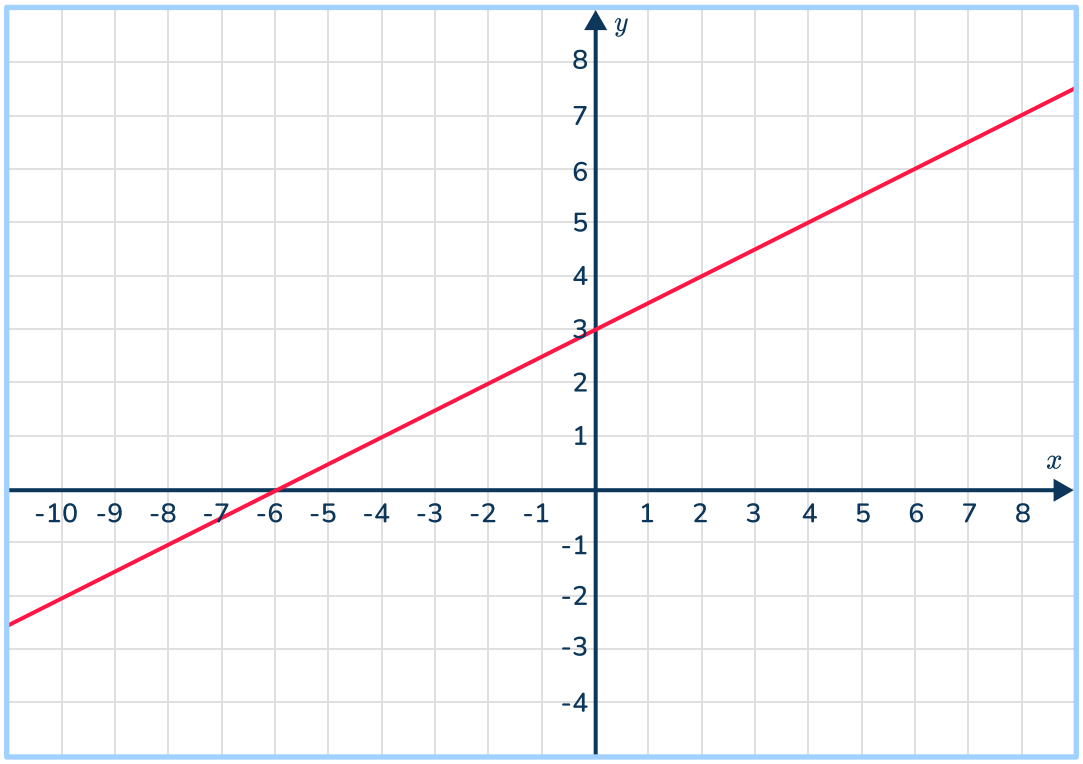
C.



D.



7 Which equation represents the line on the coordinate plane?



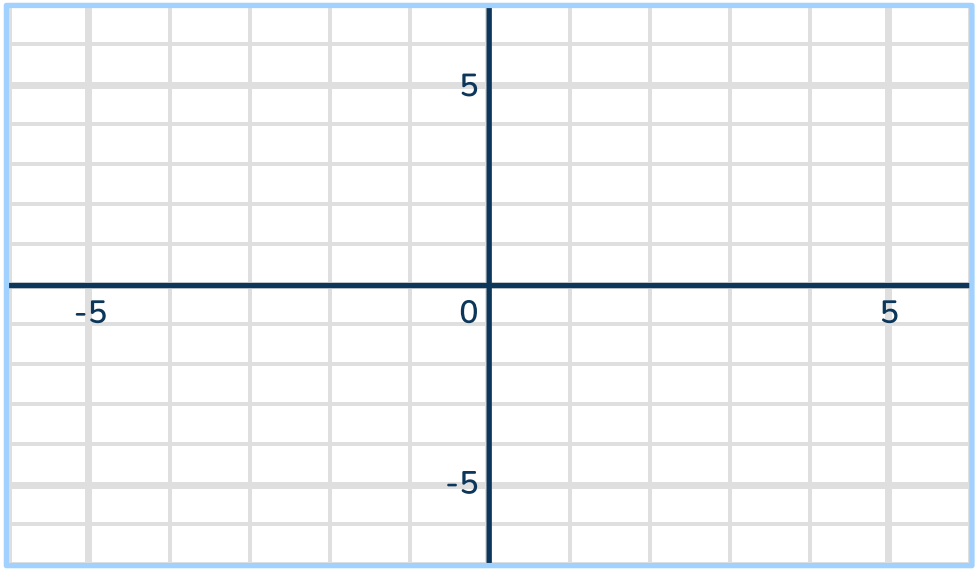
A. $y = 2x + 3$

B. $y = \frac{1}{2}x + 3$

C. $y = 2x - 3$

D. $y = \frac{1}{2}x - 6$

8 △PQR has vertices P(1, –2), Q(–3, 4), and R(2,3). The triangle is rotated 180° about the origin. What will be the coordinates of Q'?



A. (–3, –4)
B. (3, 4)
C. (–3, 4)
D. (3, –4)

---

9 What is the value of the expression below?

$$\frac{0.8 \times 10^{2}}{3.2 \times 10^{5}}$$

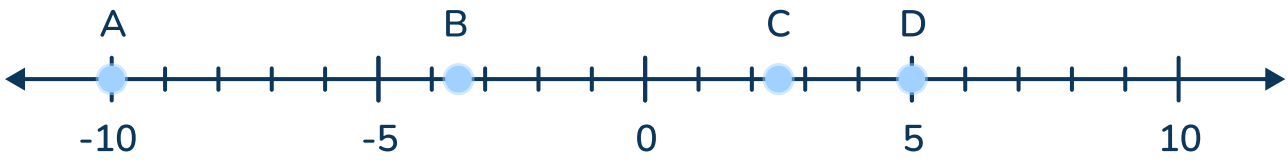
A. 2.5×10^{-3}
B. 0.4×10^{-3}
C. 2.5×10^{-4}
D. 0.4×10^{-4}

10 Pentagon ABCDE has point D(-3, 0.5). If Pentagon ABCDE is reflected over the y-axis, to form Pentagon A'B'C'D'E', what would be the coordinate of D'?

A. D'(–3, 0.5)
B. D'(3, –0.5)
C. D'(–3, –0.5)
D. D'(3, 0.5)

---

11 Which point is closest to $\sqrt{10}$?



10 Pentagon PQRST has point Q(4, -2). If Pentagon PQRST is reflected over the y-axis to form Pentagon P'Q'R'S'T', what would be the coordinates of Q'?

A. Q'(4, -2)
B. Q'(-4, 2)
C. Q'(-4, -2)
D. Q'(–4, 2)

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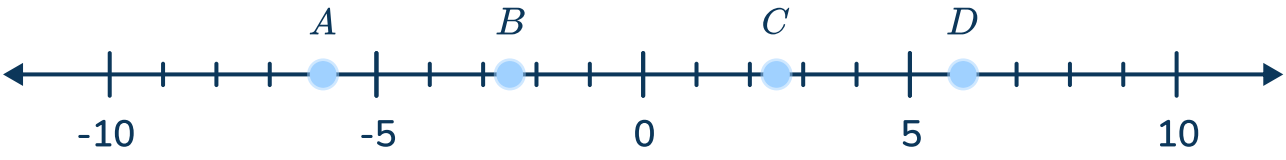
11 Which point is closest to $-\sqrt{6}$?



12 Which table represents y as a nonlinear function of x?

A.

x	2	3	4	5
y	-2	-4	-8	-14

B.

x	-3	-2	1	0
y	4	9	14	19

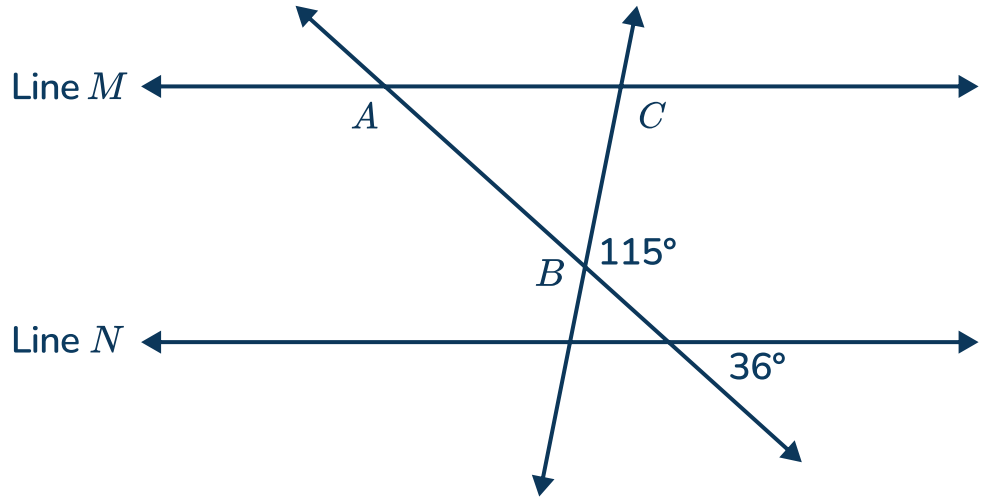
C.

x	1	2	3	4
y	$1\frac{1}{4}$	2	$2\frac{3}{4}$	$3\frac{1}{2}$

D.

x	0	1	2	4
y	-6	-4	-2	2

13 Line M and Line N are parallel lines, cut by two transversals.



What interior angles make up the triangle ABC?

A. 115°, 36°, 11°
B. 65°, 36°, and 11°
C. 115°, 36°, 79°
D. 65°, 36°, and 79°

14 The 6th and 7th graders at Riverdale High School are required to take a foreign language class, either Spanish or French.

	Spanish	French
6th graders	62	48
7th graders	75	x

If 42% of 6th and 7th graders take French, what is the value of x?

A. 99
B. 236
C. 51
D. 85

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15 The distance from Dallas to Fort Worth is about 3.4×10^4 inches. The distance from Dallas to Chicago is about 5.5×10^3 times farther. About how many inches is the distance from Dallas to Chicago?

A. 1.87×10^8
B. 18.7×10^9
C. 8.9×10^7
D. 0.89×10^8

16 The table and the equation both show a different relationship between y and x.

Function A

x	y
1	-10
3	-7
5	-4

Function B

$y = 3x - 5$

Which statement about the functions is true?

A. The rate of change of Function A is less than the rate of change of Function B because -5 > -11.5.
B. The rate of change of Function A is greater than the rate of change of Function B because -7 < - 5.
C. The rate of change of Function A is greater than the rate of change of Function B because 3 > 5.
D. The rate of change of Function A is less than the rate of change of Function B because 1.5 < 3.

17 A cylindrical water tank has a diameter of 10 feet and a height of 12 feet.
Which equation can be used to find the volume of the tank in cubic feet?
Which equation can be used to find the volume of the container in cubic feet?

A. $V = \pi (10)^2 (12)$
B. $V = \pi (5)^2 (12)$
C. $V = \pi (12)^2 (10)$
D. $V = \pi (10)^2 (144)$

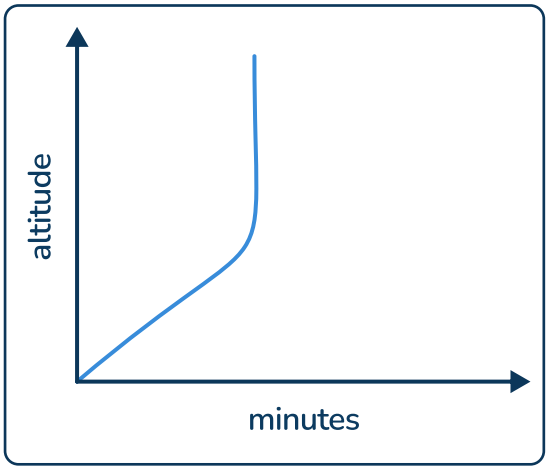
18 Which system of equations has infinite solutions?

A. $y = 3x + 1$
$y = -3x - 1$
B. $x + y = 6$
$2x - 4 = y$
C. $6x - 6y = 9$
$x = y + 1.5$
D. $4x - 2y = 10$
$x - \frac{1}{2}y = 3$

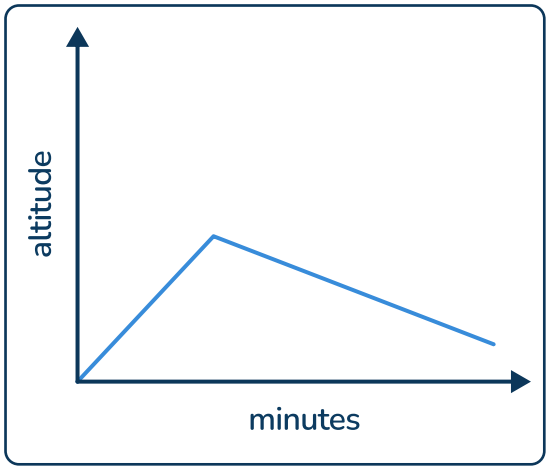
19 A hot air balloon's altitude was measured over time. Initially, the balloon was on the ground. Then it immediately began to rise. Its altitude continued to increase steadily for a few minutes, and then it leveled off, maintaining the same altitude for the remainder of the time.

Which is a graph of the function described above?

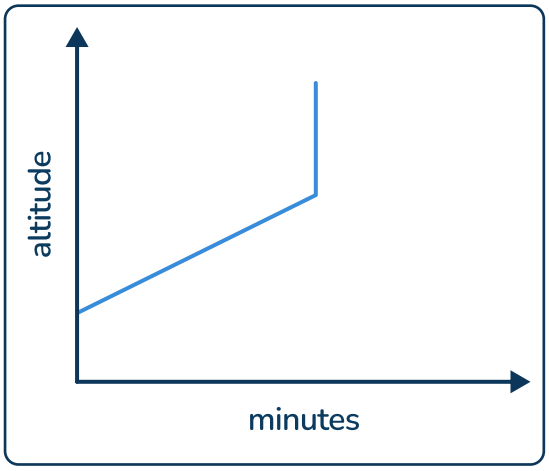
A.



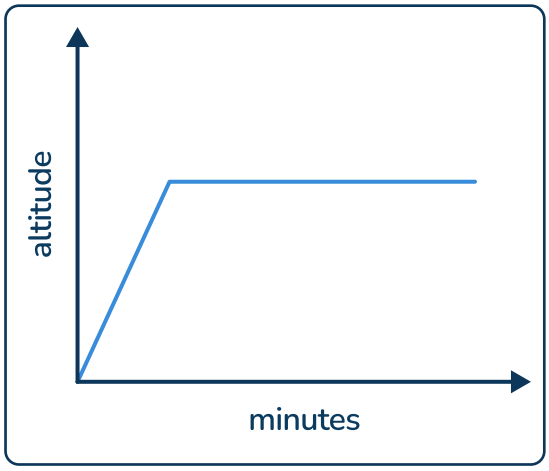
B.



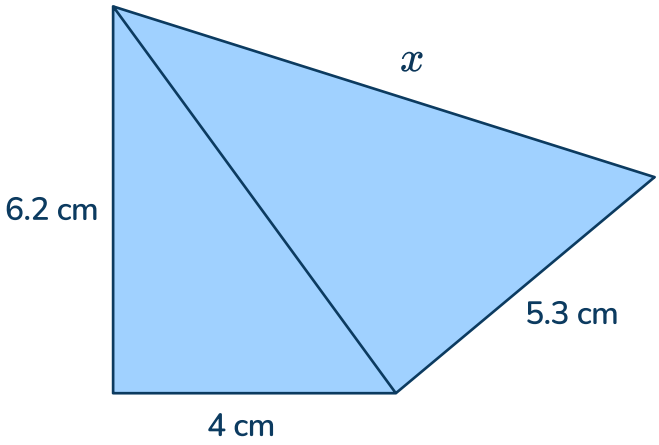
C.



D.



20 Solve for x. Round to the nearest tenth.



A. 9.1 cm
B. 8.7 cm
C. 9.3 cm
D. 8.2 cm

---

21 Which expressions are equal to –5? Select all the correct answers.

A. $\sqrt{25}$
B. $\sqrt[3]{-125}$
C. $\sqrt[3]{125}$
D. $\sqrt{-25}$

22 Which set of coordinates does not represent a function?

A. {(1, 2), (2, 3), (3, 4)}
B. {(0, 0), (2, 1), (4, 2)}
C. {(4, 5), (-1, 6), (4, 7)}
D. {(5, -1), (6, 2), (7, 3)}

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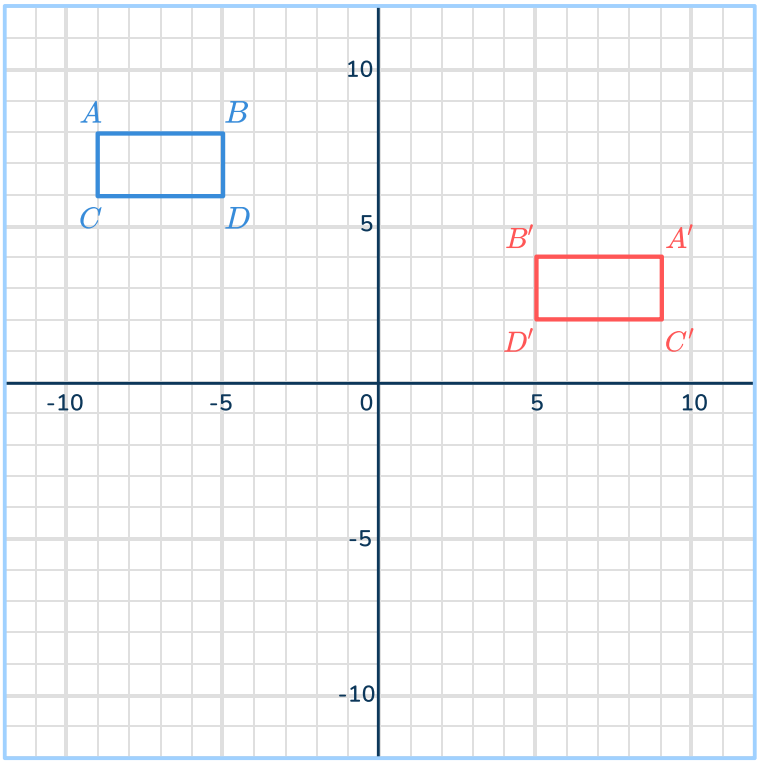
23 Which sequence of transformations maps rectangle ABCD to rectangle A'B'C'D'?



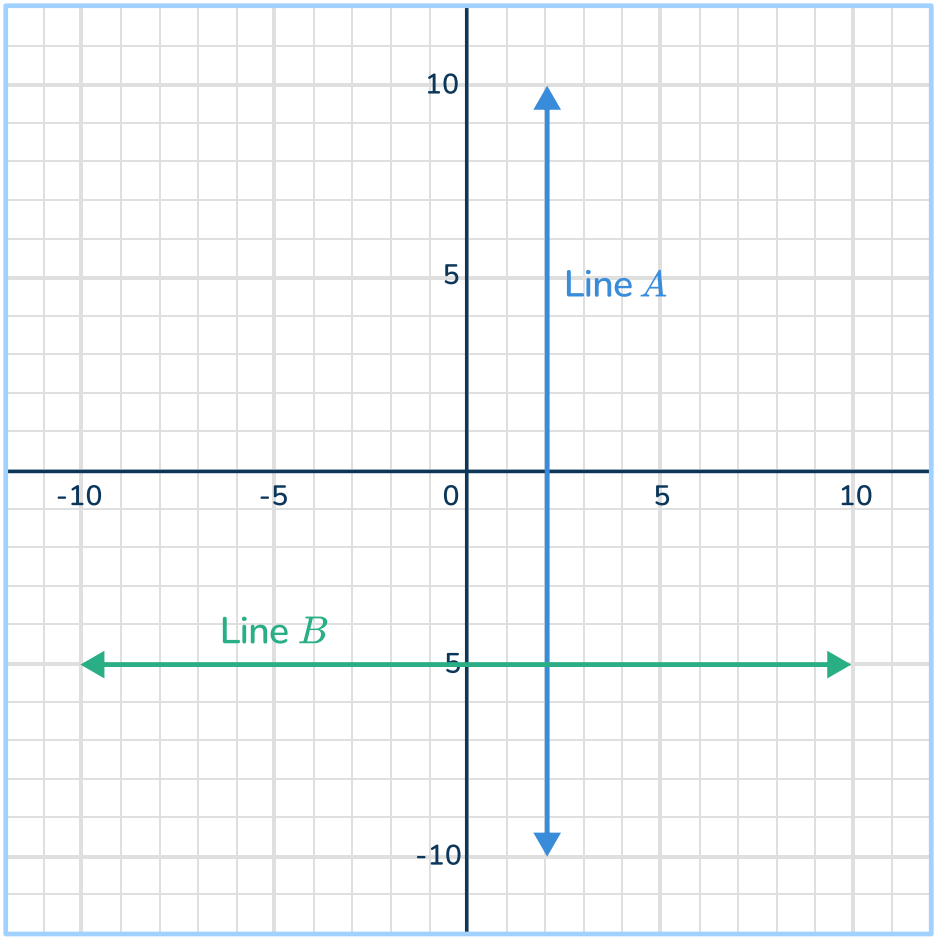
A. Reflection over the line $y = x$ followed by a translation of 2 units up.
B. Translation of 10 units left followed by a reflection over the x-axis.
C. Reflection over the x-axis followed by a translation of 4 units up.
D. Reflection over the y-axis followed by a translation of 4 units up.

24 Carrie runs her family's landscaping business. The table below shows the service charges for the number of hours worked. Which linear equation represents the information in the table?

Hours worked, x	Total amount of money charged, y
0	$60
2	$170
4	$280
6	$390

A. $y = 60x + 55$
B. $y = 85x$
C. $y = 55x + 60$
D. $y = 60x$

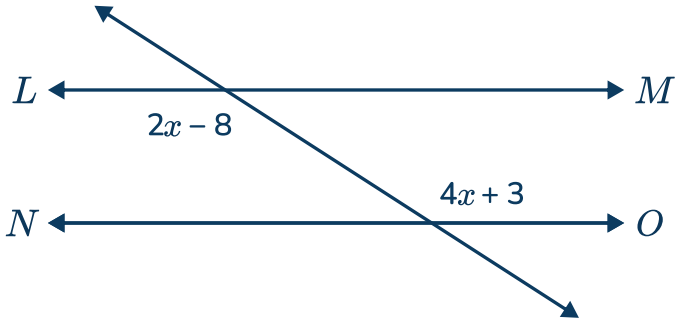
25



Which statements about the two lines shown in the graph are true? Select all the correct answers.

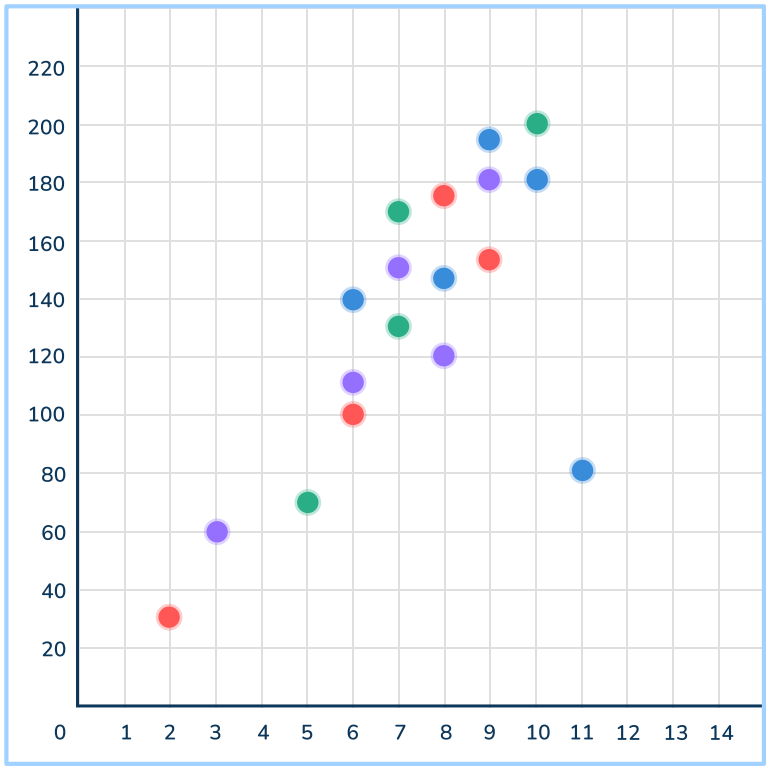
A. Line A has a slope of 2.
B. The equation of line B is $y = -5$.
C. Line B has a slope of 0.
D. The equation of line A is $x = 3$.
E. As a system, Line A and Line B have one solution.

26 Line LM and line NO are parallel. What is the value of x?



A. -22
B. -5.5
C. 2.5
D. -3.5

27



Which statement about the scatter plot is NOT true?

A. In general, x and y have a positive 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 negative slope.

28 Which numbers are irrational? Select all the correct answers.

A. $\pi + 2$

B. $\frac{2}{5}$

C. $\sqrt{16}$

D. $\sqrt{20}$

E. $\sqrt[3]{8}$

---

29 The equation $y = 10 - 0.5x$ models the height of a candle (in centimeters) after it burns for x minutes.
What is the meaning of the y-intercept?

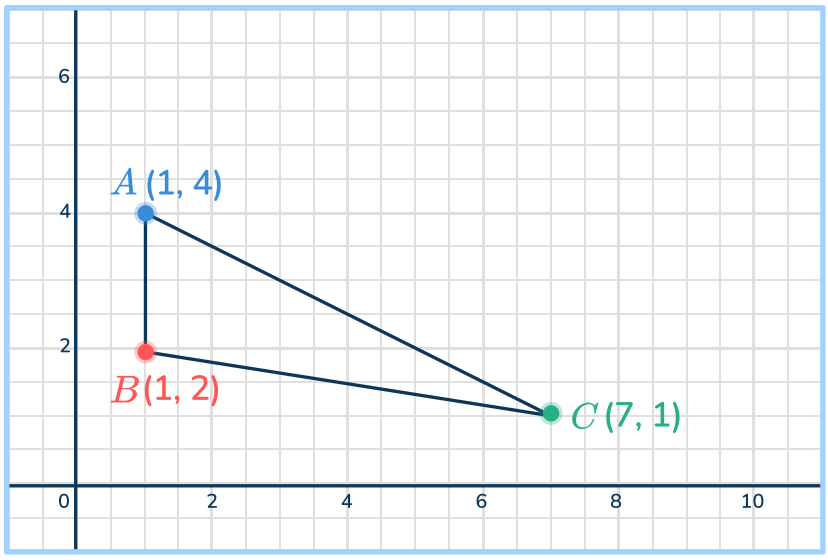
A. The minutes the candle has been burning.

B. The starting height of the candle.

C. The rate at which the candle decreases in height per minute.

D. The total time it takes for the candle to burn completely.

30



If the triangle is dilated by $\frac{1}{2}$, what is the distance from B' to C'?

Which strategies lead to the correct answer? Select all correct answers.

A. Calculate $\sqrt{6^2 + (-1)^2}$, and multiply the positive root by $\frac{1}{2}$.

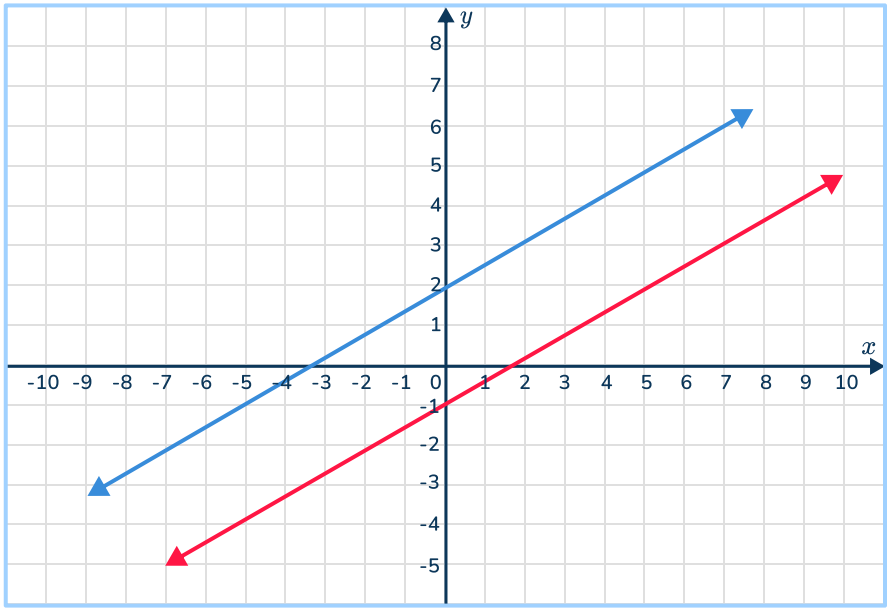
B. Calculate $6^2 + 1^2$ and multiply by $\frac{1}{2}$.

C. Multiply (1,1) and (7,1) by $\frac{1}{2}$ and then calculate the positive root of $\sqrt{3^2 + (-0.5)^2}$.

D. Multiply each coordinate by $\frac{1}{2}$ and then find the perimeter of the new triangle.

E. Shift each vertex of the triangle down $\frac{1}{2}$ units, then count the units from B' to C'.

31 How many solutions does the system of linear equations have?



A. 0
B. 1
C. 2
D. infinite

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32 **Function A:** $-2x + 40$

Function B:

x	0	2	4	6
y	40	38	36	40

Which comparison statement is correct?

A. Both functions are decreasing.
B. Both functions have a slope of –2.
C. Both functions are linear.
D. Both functions have a y-intercept of 40.

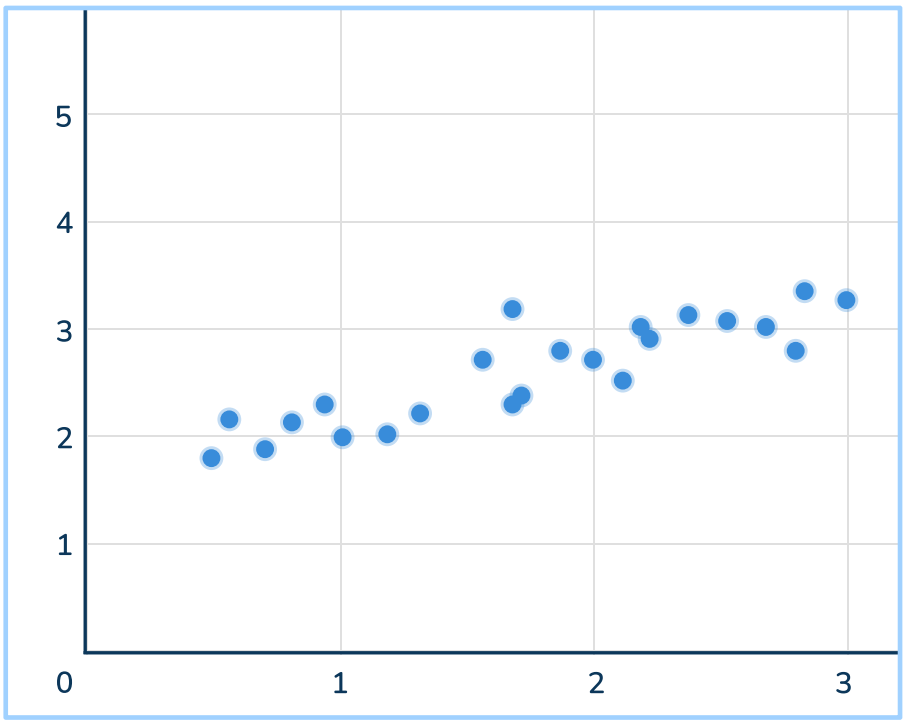
33 $\sqrt[3]{p} = 4$

Solve for p.

A. 12
B. 8
C. 64
D. $\sqrt{7}$

---

34 Which equation shows a line of best fit for the data?



A. $0.5x + 1.75 = y$
B. $2x + 2 = y$
C. $1.5 - x = y$
D. $0.5x - 1.5 = y$

35 A triangle has side lengths of 7 inches, 24 inches, and 25 inches. Is the triangle acute, right, or obtuse?

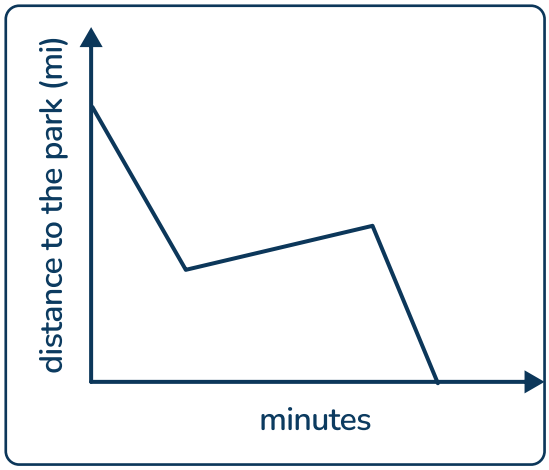
A. acute
B. right
C. obtuse
D. More information is needed

---

36 Simplify $\dfrac{3a^2(a^4)}{\frac{1}{2}a^3}$.

A. $1.5a^3$
B. $5a^2$
C. $1.5a^2$
D. $6a^3$

37 The graph shows the distance a runner is from a park.



Which statement about the function is true?

A. As the minutes increased, the runner's distance from the park decreased.
B. The runner started at the park and then ran away from it.
C. During the middle of the run, the runner was moving away from the park.
D. The runner got close to the park but never arrived.

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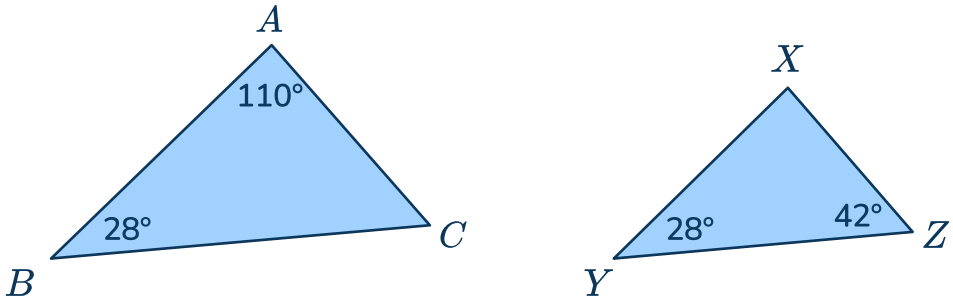
38 Are the triangles similar? Why or why not?



A. Yes, because they are both scalene triangles.
B. No, because one is larger than the other.
C. Yes, because the corresponding angles are equal.
D. No, because the corresponding sides do not have the same ratio.

39 Write 9,150,000,000,000 in scientific notation.

A. 9.15×10^{12}
B. 915×10^{11}
C. 9.15×10^{13}
D. 91.5×10^{14}

---

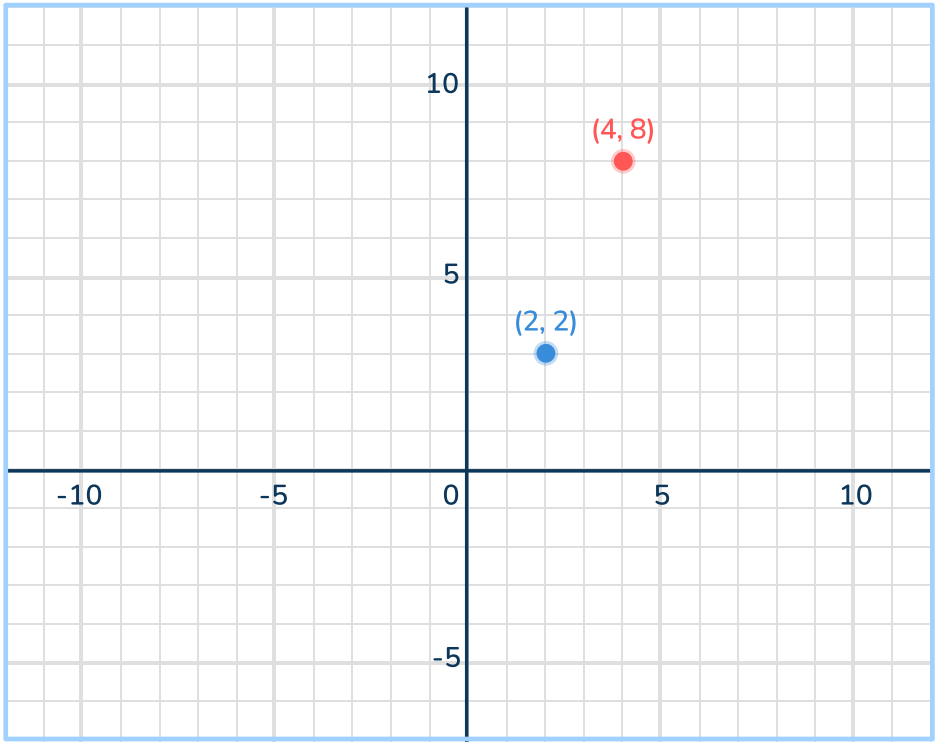
40 What value for n will make the equation have no solution?

$2x - 12 + 4 = n(\frac{1}{4}x - 5)$

A. 16
B. 8
C. $-\frac{1}{2}$
D. 0

Standard: 8.F.1, 8.F.3
DOK 3
Short Answer Response - 4 points

41



A math class is looking at the graph above. Students in the class make the following comments:

- Allie says the coordinates represent a linear function.
- Mason says the coordinates represent a nonlinear function.
- Reagan says the coordinates do not represent a function.

For each student, decide what third coordinate would prove their statement to be correct. Explain.

_____

_____

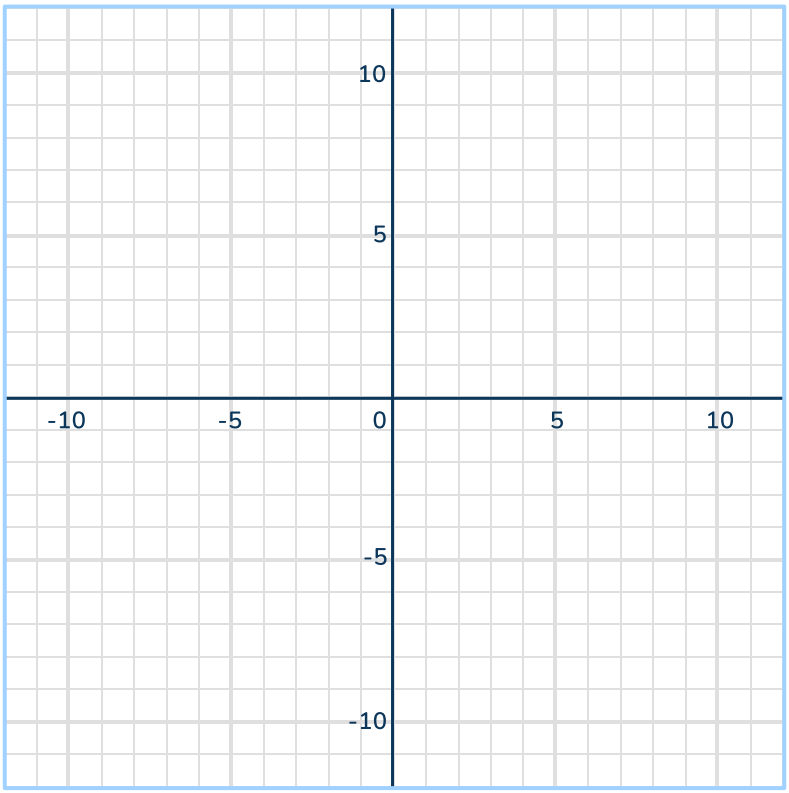
_____

_____

Standard: 8.G.A.3, 8.G.4
DOK 3
Short Answer Response - 4 points

42 Quadrilateral ABCD has points A(-3, 2), B(-5, -4), C(2, 3), and D(4, -2). The quadrilateral is dilated by a scale factor of 1.5 about the origin and then reflected over the line $y = x$.

Draw the new quadrilateral.



Compared to the original, explain whether the new shape is congruent, similar or neither. Include the effects of the dilation and reflection in your explanation.

Answer Key - Multiple Choice

Item number	Correct answer	Standard(s)	DOK
1	C	**8.EE.6**	DOK 2
2	A	**8.G.9**	DOK 2
3	B	**8.G.8**	DOK 1
4	D	**8.EE.7b**	DOK 2
5	A, E	**8.EE.1**	DOK 2
6	C	**8.F.1**	DOK 1
7	B	**8.EE.6**	DOK 1
8	D	**8.G.3**	DOK 2
9	C	**8.EE.4**	DOK 1
10	C	**8.G.3**	DOK 2
11	B	**8.NS.2**	DOK 2
12	A	**8.F.3**	DOK 1
13	D	**8.G.5**	DOK 2
14	C	**8.SP.4**	DOK 2
15	A	**8.EE.3**	DOK 2
16	D	**8.F.3**	DOK 2
17	B	**8.G.9**	DOK 2
18	C	**8.EE.8b**	DOK 1
19	D	**8.F.5**	DOK 2

Item number	Correct answer	Standard(s)	DOK
20	A	**8.G.7**	DOK 2
21	B	**8.EE.2**	DOK 1
22	C	**8.F.1**	DOK 1
23	D	**8.G.3**	DOK 2
24	C	**8.F.4**	DOK 2
25	B, C, E	**8.EE.5, 8.EE.6, 8.EE.8, 8.F.2**	DOK 2
26	B	**8.G.5**	DOK 1
27	D	**8.SP.1**	DOK 2
28	A, D	**8.NS.1**	DOK 1
29	B	**8.SP.3**	DOK 2
30	A, C	**8.G.3, 8.G.8**	DOK 2
31	A	**8.EE.8a**	DOK 1
32	D	**8.F.2**	DOK 2
33	C	**8.EE.2**	DOK 1
34	A	**8.SP.2**	DOK 2
35	B	**8.G.6**	DOK 1
36	D	**8.EE.1**	DOK 2
37	C	**8.F.5**	DOK 2
38	C	**8.G.4, 8.G.5**	DOK 2
39	A	**8.EE.3**	DOK 1
40	B	**8.EE.7a**	DOK 2

ANSWERS SORTED BY CCSS STRAND

EE			
1	C	**8.EE.6**	DOK 2
4	D	**8.EE.7b**	DOK 2
5	A, E	**8.EE.1**	DOK 2
7	B	**8.EE.6**	DOK 1
9	C	**8.EE.4**	DOK 1
15	A	**8.EE.3**	DOK 2
18	C	**8.EE.8b**	DOK 1
21	B	**8.EE.2**	DOK 1
25	B, C, E	**8.EE.5, 8.EE.6, 8.EE.8, 8.F.2**	DOK 2
31	A	**8.EE.8a**	DOK 1
33	C	**8.EE.2**	DOK 1
36	D	**8.EE.1**	DOK 2
39	A	**8.EE.3**	DOK 1
40	B	**8.EE.7a**	DOK 2
41	Short Answer Response	**8.EE.7b**	DOK 3

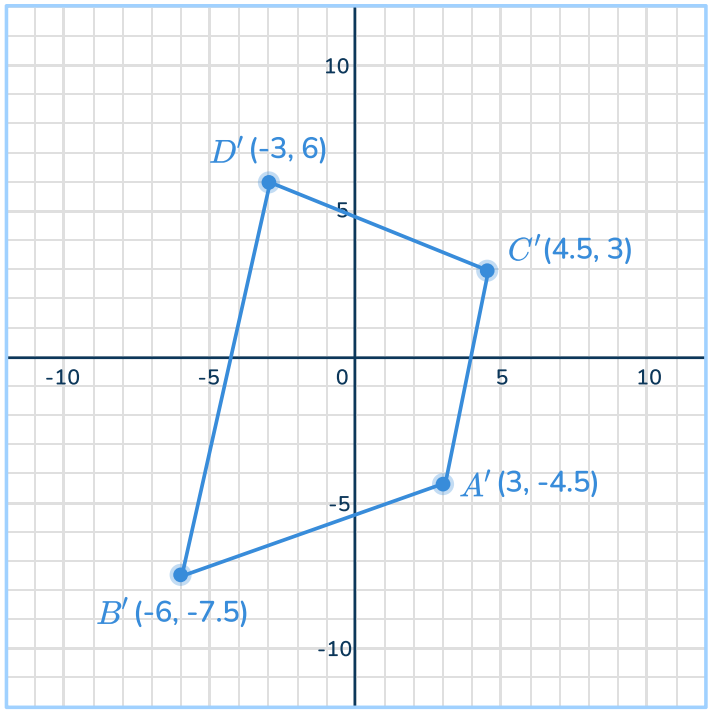
F			
6	C	**8.F.1**	DOK 1
12	A	**8.F.3**	DOK 1
16	D	**8.F.2**	DOK 2
19	D	**8.F.5**	DOK 2
22	C	**8.F.1**	DOK 1
24	C	**8.F.4**	DOK 2
32	D	**8.F.2**	DOK 2
37	C	**8.F.5**	DOK 2
42	Short Answer Response	**8.F.1, 8.F.3**	DOK 3

NS			
11	B	**8.NS.2**	DOK 2
28	A, D	**8.NS.1**	DOK 1

G			
2	A	**8.G.9**	DOK 2
3	B	**8.G.8**	DOK 1
8	D	**8.G.3**	DOK 2
10	C	**8.G.3**	DOK 2
13	D	**8.G.5**	DOK 2
17	B	**8.G.9**	DOK 2
20	A	**8.G.7**	DOK 2
23	D	**8.G.3**	DOK 2
26	B	**8.G.5**	DOK 1
30	A, C	**8.G.3, 8.G.8**	DOK 2
35	B	**8.G.6**	DOK 1
38	C	**8.G.4, 8.G.5**	DOK 2

SP			
14	C	**8.SP.4**	DOK 2
27	D	**8.SP.1**	DOK 2
29	B	**8.SP.3**	DOK 2
34	A	**8.SP.2**	DOK 2

Item	KEY	Rationale
41	4 points	Student correctly identifies a coordinate for each student. • **Allie**: A point like (6,14) would support that the coordinates lie on a linear function because it falls on the line defined by the linear relationship between the given points. • **Mason**: A point like (4, 12) would prove Mason's statement that the coordinates represent a nonlinear function. If this point does not lie on the line defined by the given points, it suggests the relationship is not linear. • **Reagan**: Points with repeated x-values like (4,10) or (2,5) would prove that the coordinates do not represent a function, confirming Reagan's statement. Multiple y-values for the same x-value demonstrates that the set of coordinates does not satisfy the definition of a function. The student clearly explains how each coordinate supports the corresponding student's claim.
	3 points	Student correctly identifies a coordinate for each student. The student explains how each coordinate supports the corresponding student's claim, but some parts of the explanation are incomplete or unclear.
	2 points	Student correctly identifies a coordinate for 2 of the 3 students. The student explains how each coordinate supports the corresponding student's claim but makes mistakes in 1 claim.
	1 point	Student correctly identifies a coordinate for 2 of the 3 students. The student attempts to explain how each coordinate supports the corresponding student's claim, but the explanation is incomplete or unclear.
	0 points	Response is blank or does not include any correct calculations or explanations.

Item	KEY	Rationale
42	4 points	The student correctly identifies the 4 new coordinates.  The student clearly explains that the new shape will be similar since it was dilated, all the corresponding sides in the original and new shape have the same ratio and the reflection only changes the orientation.
	3 points	The student correctly identifies the 4 new coordinates. The student explains that the new shape will be similar, but some parts of the explanation are incomplete or unclear.
	2 points	The student correctly identifies the 3 out of the 4 new coordinates. The student clearly explains that the new shape will be similar since it was dilated, all the corresponding sides in the original and new shape have the same ratio and the reflection only changes the orientation.

Item	KEY	Rationale
	1 point	The student identifies less than 3 of the new coordinates. The student attempts to explain how each coordinate supports the corresponding student's claim, but the explanation is incomplete or unclear.
	0 points	Response is blank or does not include any correct calculations or explanations.

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