Tennessee Comprehensive Assessment Program

TCAP

Math

Grade 8 Test Practice

TN Department of Education

Metadata—Math

Items

Page Number	Grade	Item Type	Key	EOL	TN Standards	Calculator
1	8	MC	C	2	8.NS.A.2	N
2	8	MC	B	3	8.EE.C.7.b	N
3	8	MS	A,D	3	8.EE.A.1	N
4	8	MC	B	3	8.G.A.1.d	N
5	8	MC	B	2	8.EE.A.3	N
6	8	MC	A	2	8.EE.C.9	N
7	8	MC	B	3	8.SP.A.2	N
8	8	MC	A	3	8.EE.C.8.a	N
9	8	MC	B	3	8.EE.A.2	N
10	8	MC	A	3	8.F.B.4	N
11	8	MS	B,C,E	3	8.F.A.1	N
12	8	MC	C	2	8.NS.A.1	N
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14	8	MC	A	2	8.F.B.5	Y
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16	8	MC	B	3	8.EE.C.7.b	Y
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18	8	MC	C	3	8.F.B.4	Y
19	8	MC	D	3	8.SP.A.1	Y
21	8	MS	B,C	4	8.F.A.2	Y
22	8	MC	C	4	8.EE.B.5	Y
23	8	MC	B	3	8.G.A.1.b	Y
24	8	MC	A	2	8.F.B.5	Y
25	8	MC	B	3	8.EE.A.1	Y
26	8	MC	B	3	8.F.A.3	Y
27	8	MC	A	3	8.G.C.6	Y
28	8	MC	C	3	8.EE.C.7.b	Y
29	8	MC	D	3	8.G.B.3	Y
30	8	MC	C	3	8.EE.A.4	Y
31	8	MC	C	3	8.G.A.1.a	Y
32	8	MC	A	3	8.EE.B.5	Y
33	8	MC	C	3	8.G.B.5	Y
34	8	MC	A	2	8.EE.C.7.a	Y
35	8	MC	C	3	8.G.B.4	Y
36	8	MC	D	2	8.EE.A.4	Y
37	8	MS	A,C	3	8.SP.A.3	Y
38	8	MC	C	2	8.EE.B.6	Y

39	8	MC	A	3	8.G.C.6	Y
40	8	MC	D	2	8.EE.C.7.a	Y
41	8	MC	C	3	8.G.B.4	Y

Metadata Definitions

Grade	Grade level or Course.
Item Type	Indicates the type of item. MC= Multiple Choice; MS= Multiple Select
Key	Correct answer.
EOL	Evidence of Learning (EOL) statements provide indication of how students are tracking toward grade-level conceptual understanding of the Tennessee Mathematic Standards. Performance at Level 2 demonstrates that the student is **approaching** grade-level understanding and has a **partial** ability to apply the grade-/course-level knowledge and skills defined by the Tennessee Academic Standards Performance at Level 3 demonstrates that the student has a **comprehensive** understanding and **thorough** ability to apply the grade-/course-level knowledge and skills defined by the Tennessee Academic Standards Performance at Level 4 demonstrated that the student has an **extensive** understanding and **expert** ability to apply the grade-/course-level knowledge and skills defined by the Tennessee Academic Standards
TN Standards	Primary educational standard assessed.
Calculator	Y for items that permit calculator use.

00. The irrational number $(\sqrt{10})^3$ is between which two whole numbers?

A. The number is between 5 and 10.

B. The number is between 15 and 20.

C. The number is between 30 and 35.

D. The number is between 35 and 40.

00. Solve the equation**:**

$$\frac{2}{3}\left(\frac{1}{2}x+\frac{9}{4}\right)=\frac{5}{12}$$

What is the value of x?

A. $-\frac{11}{2}$

B. $-\frac{13}{4}$

C. $\frac{5}{22}$

D. $\frac{23}{4}$

00. Which expressions are equivalent to $\frac{3}{(3^{-4})^{2}}$?

Select the **two** correct answers.

A. $\frac{3}{3^{-8}}$

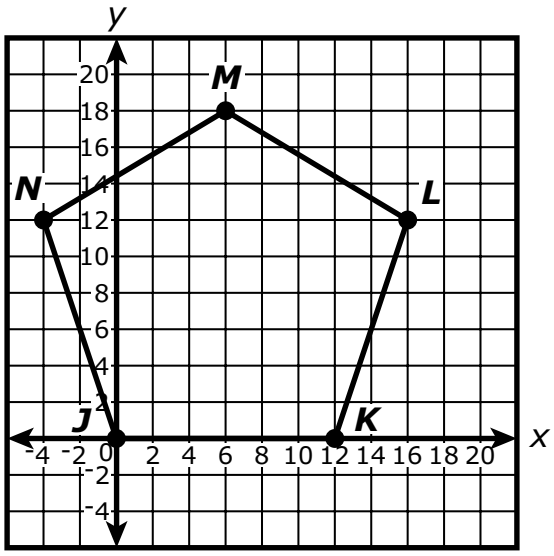
B. $\frac{3}{3^{-2}}$

C. 3^{3}

D. $(3^{3})^{3}$

E. $(3^{1})(3^{6})$

00. Pentagon *JKLMN* is shown on a coordinate plane.



If the pentagon is dilated about the origin by a scale factor of $\frac{4}{3}$, what is the length of $\overline{J'K'}$ in units?

A. 9

B. 16

C. 45

D. 80

00. A certain organism is approximately 5×10^{-4} meters in length. What is the length of the organism, in meters, in standard form?

A. 0.00005

B. 0.0005

C. 5,000

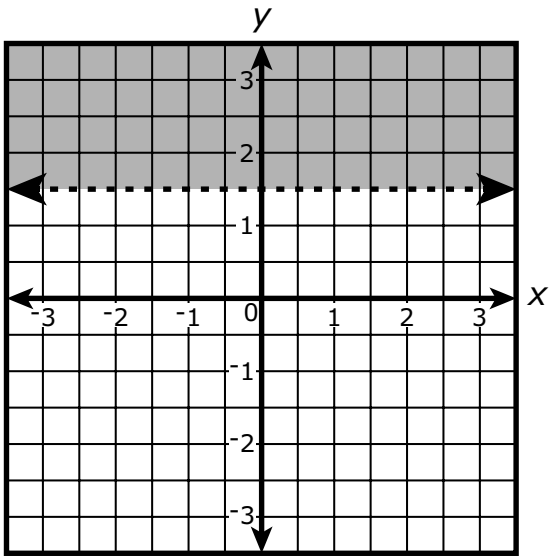
D. 50,000

00. An inequality is given.

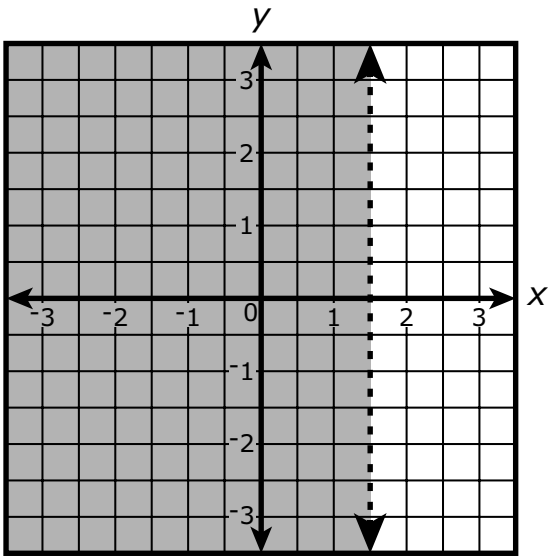
$$y > \frac{3}{2}$$

Which graph represents the solution set of the inequality?

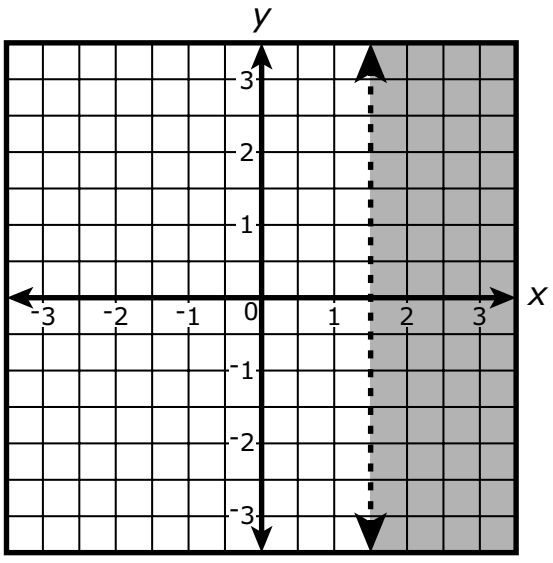
A.



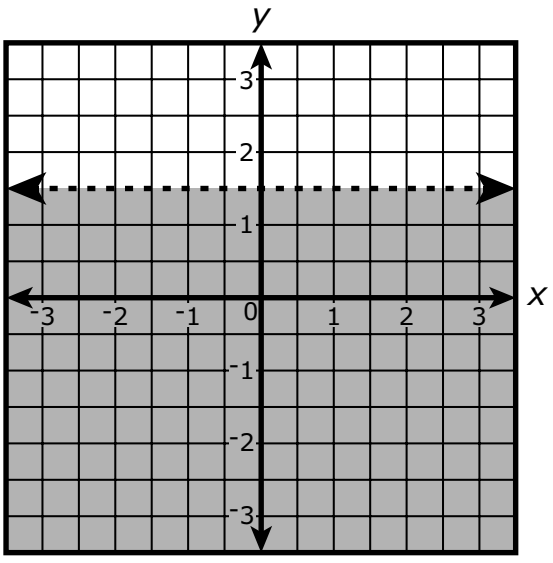
C.



B.

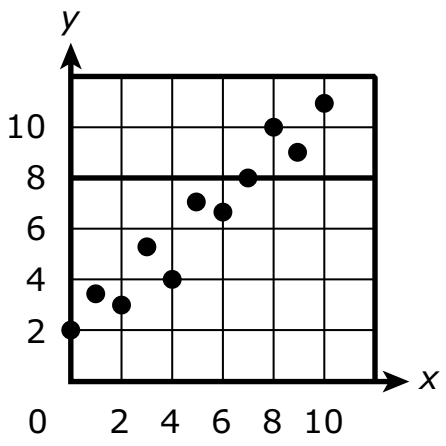


D.

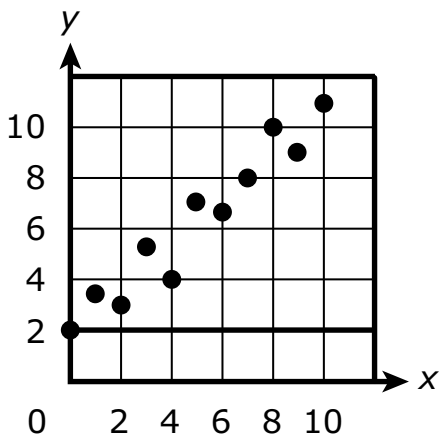


00. Which line **most** closely models the association of the data represented by the scatter plot?

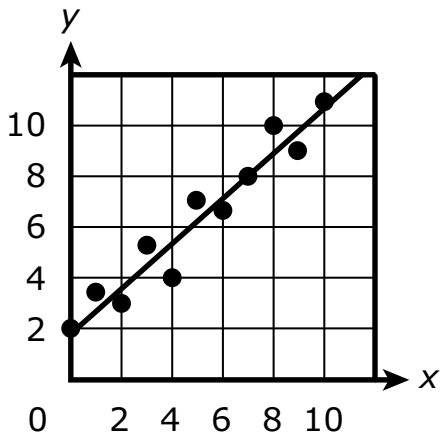
A.



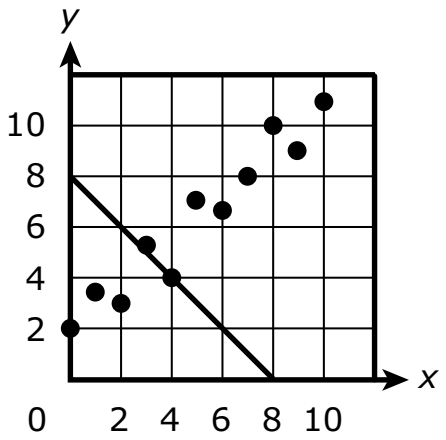
C.



B.



D.



00. A system of equations is given.

$$\begin{cases} y = 4 - 2x \\ y = x + 1 \end{cases}$$

When graphed, which statement about the system of equations is true?

A. The solution is (1, 2) because when graphed this is the point of intersection.

B. The solution is (1, 2) because when graphed they are the same line.

C. There is no solution because when graphed the lines do not intersect.

D. There are infinitely many solutions because when graphed both lines have the same slope.

00. What is the value of the expression?

$$\frac{\sqrt{64}}{\sqrt[3]{8}}$$

A. 8

B. 4

C. 2

D. 1

00. A line passes through the origin and the point (10, 9) on a coordinate plane. What is the equation of the line?

A. $y = \frac{9}{10}x$

B. $y = \frac{10}{9}x$

C. $y + 9 = x + 10$

D. $y + 10 = x + 9$

00. Which sets of ordered pairs represent functions?

Select the **three** correct answers.

A. {(2, −1), (2, −3), (2, 5), (2, 7)}

B. {(3, 6), (0, −5), (1, −5), (8, 2)}

C. {(−2, 4), (0, 5), (7, −6), (8, 3)}

D. {(1, −2), (4, −3), (4, 2), (6, 8)}

E. {(−3, 5), (−1, 5), (3, 5), (6, 5)}

00. Which statement accurately describes the square root of 8?

A. It has a terminating decimal.

B. It has a repeating decimal.

C. It is an irrational number.

D. It is an integer.

00. Each example represents a function.

Function 1:

Ty uses a gift card to rent video games. The table shows the value of the gift card, y, as a function of the number of rentals, x, that Ty makes.

x	0	1	2	3
y	15.00	12.50	10.00	7.50

Function 2:

Yuri pays $8 a month for a video game service plus a one-time fee of $12 to set up his account. The equation shows the cost, c, of the video game service as a function of the number of months, m.

$$c = 8m + 12$$

Which statement correctly compares the slopes of the functions?

A. Function 1 has positive slope and function 2 has negative slope.

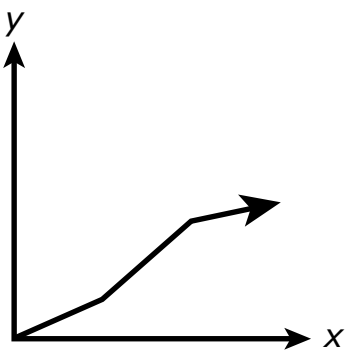
B. Function 1 has negative slope and function 2 has positive slope.

C. Both functions have positive slopes.

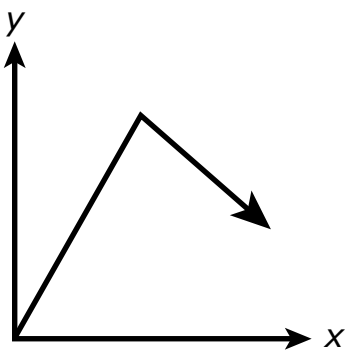
D. Both functions have negative slopes.

00. Which graph shows a function that is always increasing?

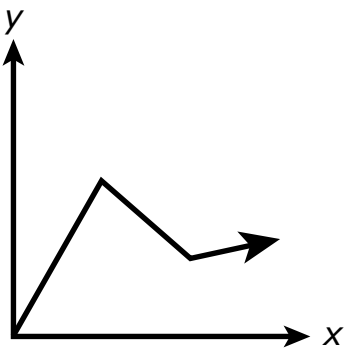
A.



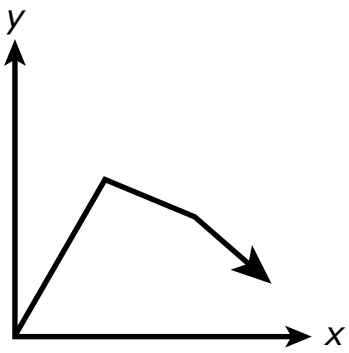
C.



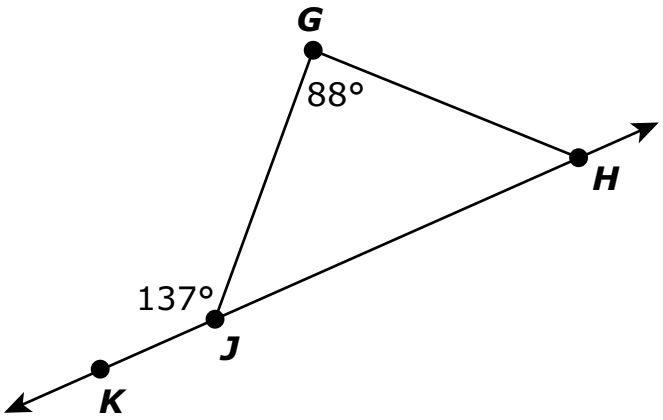
B.



D.



00. The figure shows $\overleftrightarrow{KH}$ and $\triangle GHJ$, along with some angle measures.



What is the measure of $\angle GHJ$?

A. 43°

B. 45°

C. 47°

D. 49°

00. What is the value of w in the given equation?

$$22 + \frac{1}{2}(w - 16) = 32$$

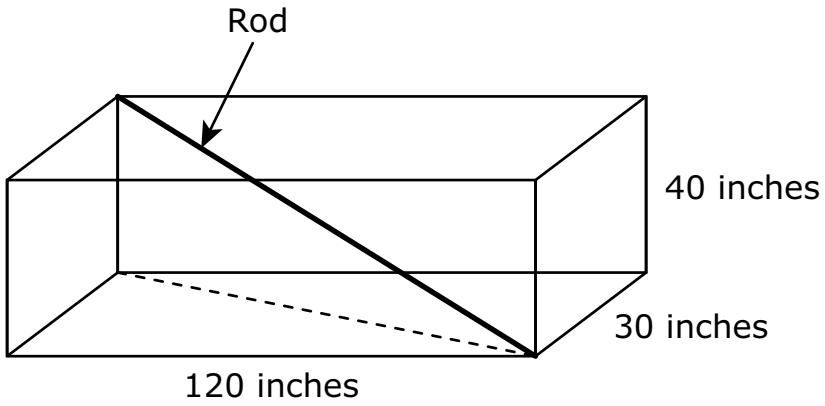
A. 9

B. 36

C. 52

D. 92

00. A box shaped like a rectangular prism has a length of 120 inches, a width of 30 inches, and a height of 40 inches. A rod will be placed diagonally in the box from a top corner to the opposite bottom corner, as shown in the image.



Which measurement **best** represents the length of the rod to the nearest inch?

A. 110

B. 124

C. 126

D. 130

00. The table shows two points on the graph of a linear function.

x	***y***
-3	11
5	-1

Which function models the linear relationship between x and y?

A. $y = -\frac{2}{3}x - \frac{13}{3}$

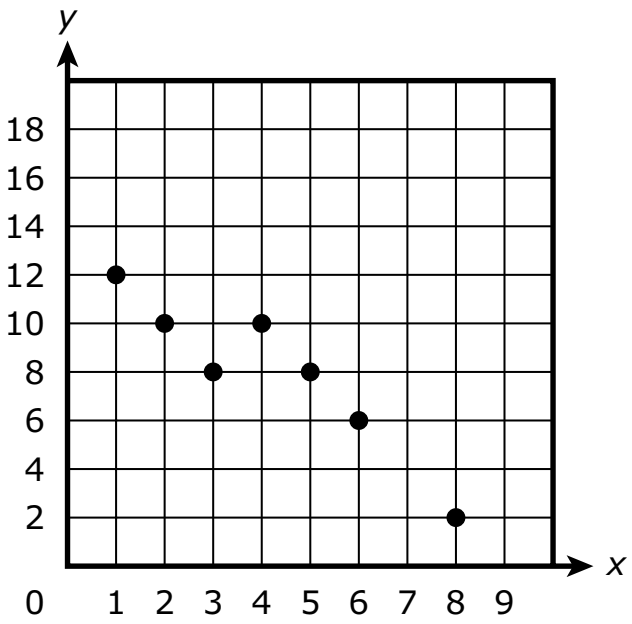
B. $y = -\frac{2}{3}x + \frac{7}{3}$

C. $y = -\frac{3}{2}x + \frac{13}{2}$

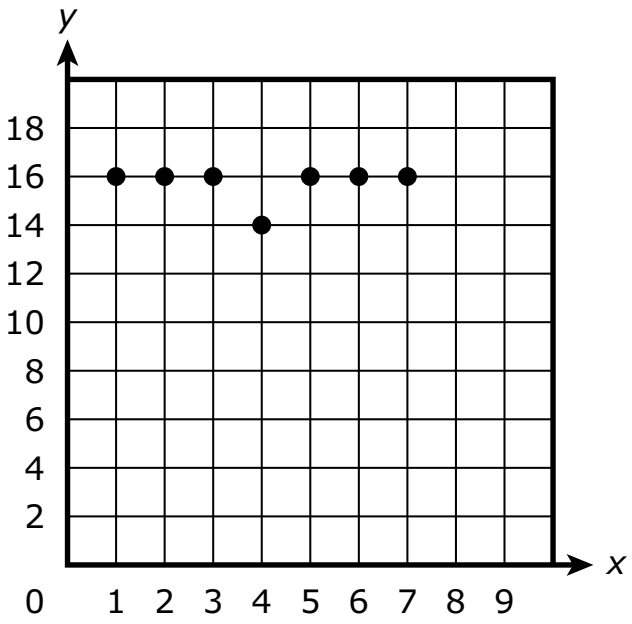
D. $y = -\frac{3}{2}x + \frac{31}{2}$

00. Which scatter plot represents a positive association between the data?

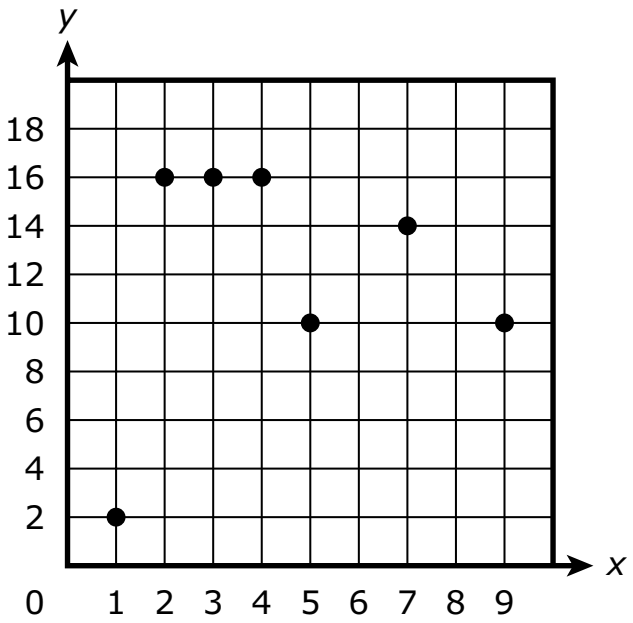
A.



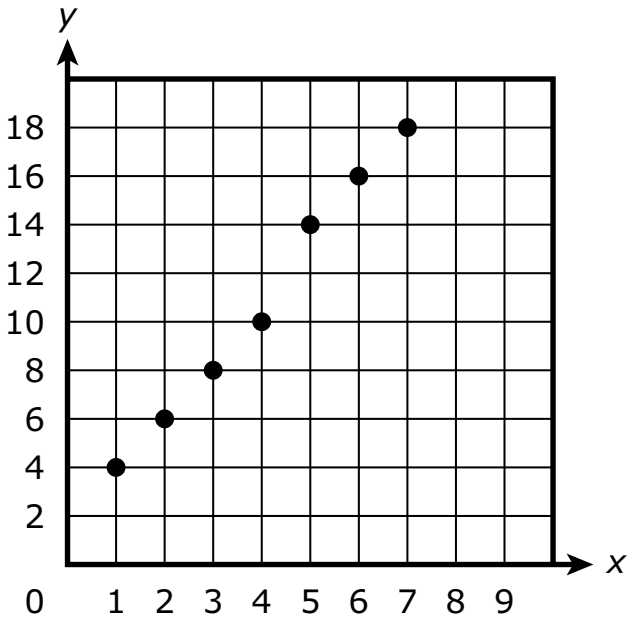
B.



C.


y
18
16
14
12
10
8
6
4
2
0
1 2 3 4 5 6 7 8 9
x

D.


y
18
16
14
12
10
8
6
4
2
0
1 2 3 4 5 6 7 8 9
x

00. Samantha recorded the amount, in dollars, she spent on ride-share costs during one month without a ride-share membership and the amount, in dollars, she spent in one month with a ride-share membership. With a membership, she determined the equation $y = 15.25x + 10$ represents the total cost for each ride, x, in the last month plus the membership fee.

The table below shows the total cost after a number of rides taken without a membership.

Ride-Share Costs Without Membership

Total Rides	1	2	3	4
Cost ($)	$17.25	$34.50	$51.75	$69.00

Which statements are true?

Select the **two** correct answers.

A. It will be cheaper for Samantha to join the ride-share membership if she only takes 4 rides.

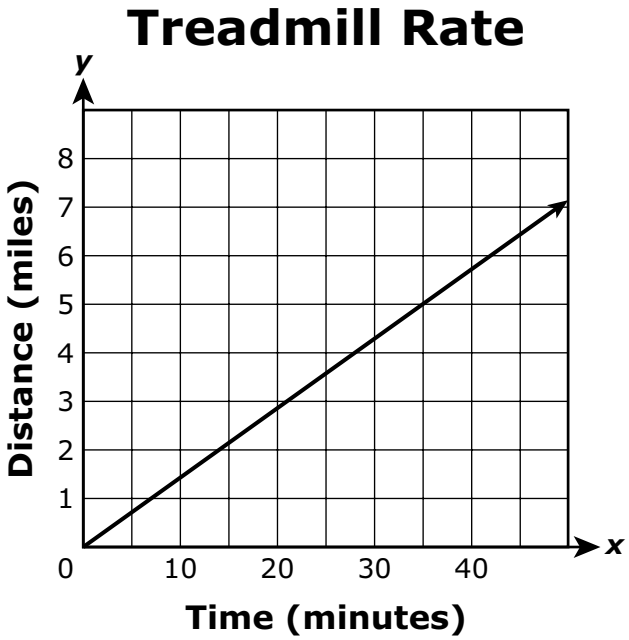
B. It will be cheaper for Samantha to join the ride-share membership if she takes more than 5 rides in one month.

C. The average rate per ride costs less with the membership than without the membership.

D. The average rate per ride costs less without the membership than with the membership.

E. Samantha should always join the ride-share membership no matter how many rides she takes each month.

00. A treadmill was set at a constant rate. The graph models the relationship between the distance tracked on the treadmill and the amount of time the treadmill operated.



What does the slope of the line represent in this context?

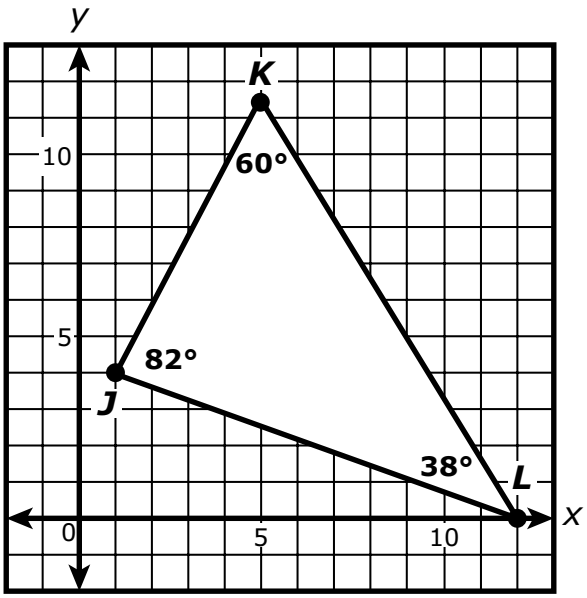
A. A runner travels $\frac{1}{10}$ mile per minute.

B. A runner travels $\frac{1}{8}$ mile per minute.

C. A runner travels $\frac{1}{7}$ mile per minute.

D. A runner travels $\frac{1}{5}$ mile per minute.

00. Triangle *JKL* lies in the coordinate plane, as shown.



Triangle *JKL* is dilated by a scale factor of $\frac{1}{2}$ about the origin to create triangle *J′K′L′*.

What is the measure of ∠*L′*?

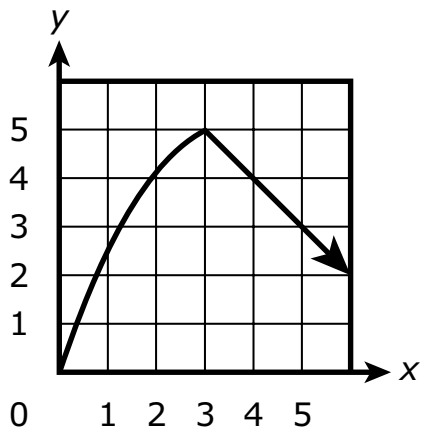
A. 19°

B. 38°

C. 76°

D. 82°

00. The graph of a function that begins at the origin is shown on the coordinate plane.



Which statement about the function is true?

A. The function increases, then decreases.

B. The function decreases, then increases.

C. The function increases, then remains constant.

D. The function decreases, then remains constant.

00. Which expression is equivalent to $\frac{(3^{-5})(5^{-3})}{(5^{4})(5^{-2})}$?

A. $\frac{1}{5^{2}}$

B. $\frac{3^{-5}}{5^{5}}$

C. $\frac{1}{5^{-8}}$

D. $(3^{-5})(5^{9})$

00. Which statement about the graph of $y = -\frac{1}{3}x + 12$ is true?

A. The graph represents a linear function that passes through (0, 0).

B. The graph represents a linear function that passes through (0, 12).

C. The graph represents a nonlinear function that passes through (0, 0).

D. The graph represents a nonlinear function that passes through (0, 12).

00. A cone has a radius of 6 cm and a height of 21 cm. A student wants to find the volume of the cone. Part of the student's work is shown.

$$V = \frac{1}{3}\pi(6)(21)$$

What did the student do incorrectly?

A. The student did not square the radius.

B. The student did not square the height.

C. The student did not square π.

D. The student used the formula for a sphere.

00. What value of x would make the equation $\frac{1}{2}(x-10)+2=-\frac{1}{4}(2x-4)$ true?

A. 0

B. 2

C. 4

D. 5

00. If three sides of a triangle measure lengths of 2, 4, and $\sqrt{20}$, what does the converse of the Pythagorean theorem tell us about the triangle?

A. Since $a^2 + b^2 = c^2$, the triangle is right and isosceles.

B. Since $a^2 + b^2 \neq c^2$, the triangle is not right.

C. Since $a^2 + b^2 = c^2$, the triangle is right and equilateral.

D. Since $a^2 + b^2 = c^2$, the triangle is right.

00. What is the value of the expression?

$$\frac{7.5 \times 10^{6}}{1.5 \times 10^{3}}$$

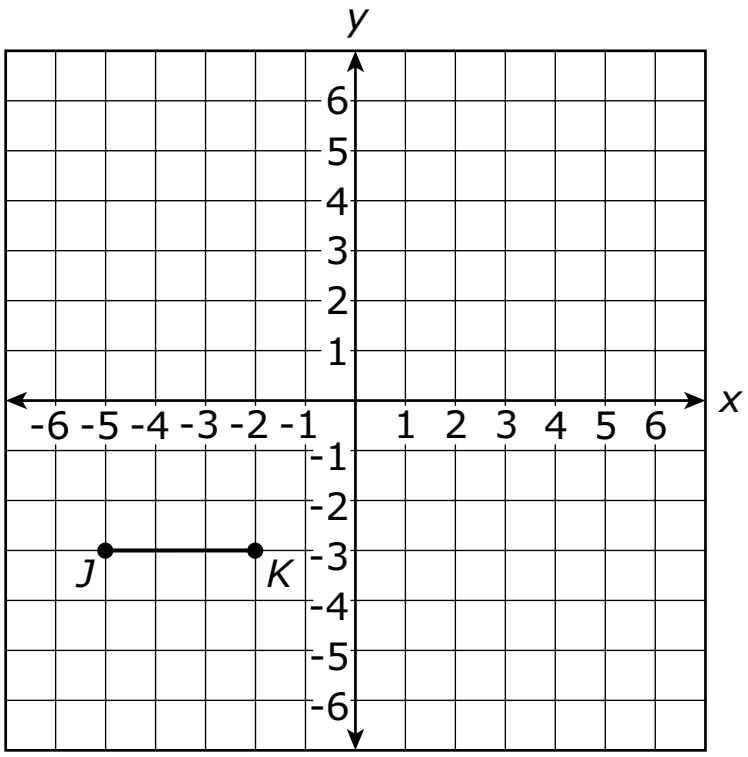
A. 500

B. 700

C. 5,000

D. 7,000

00. A line segment, $\overline{JK}$, is graphed on the coordinate plane.



Which statement is true?

A. When $\overline{JK}$ is rotated counter-clockwise 90 degrees, the length of the line segment is 4 units.

B. When $\overline{JK}$ is reflected across the y-axis, the line segment is vertical.

C. When $\overline{JK}$ is translated 4 units right and 2 units down, the length of the line segment is 3 units.

D. When $\overline{JK}$ is rotated clockwise 90 degrees, the line segment will be horizontal.

00. The number of miles, m, that a car can travel on g gallons of gas is represented by $m = 28.6g$. Similar information for a truck is displayed in the table.

Truck

Number of Gallons	Distance (Miles)
3	88.5
5	147.5
6	177.0
9	265.5

Which statement about the two vehicles is true?

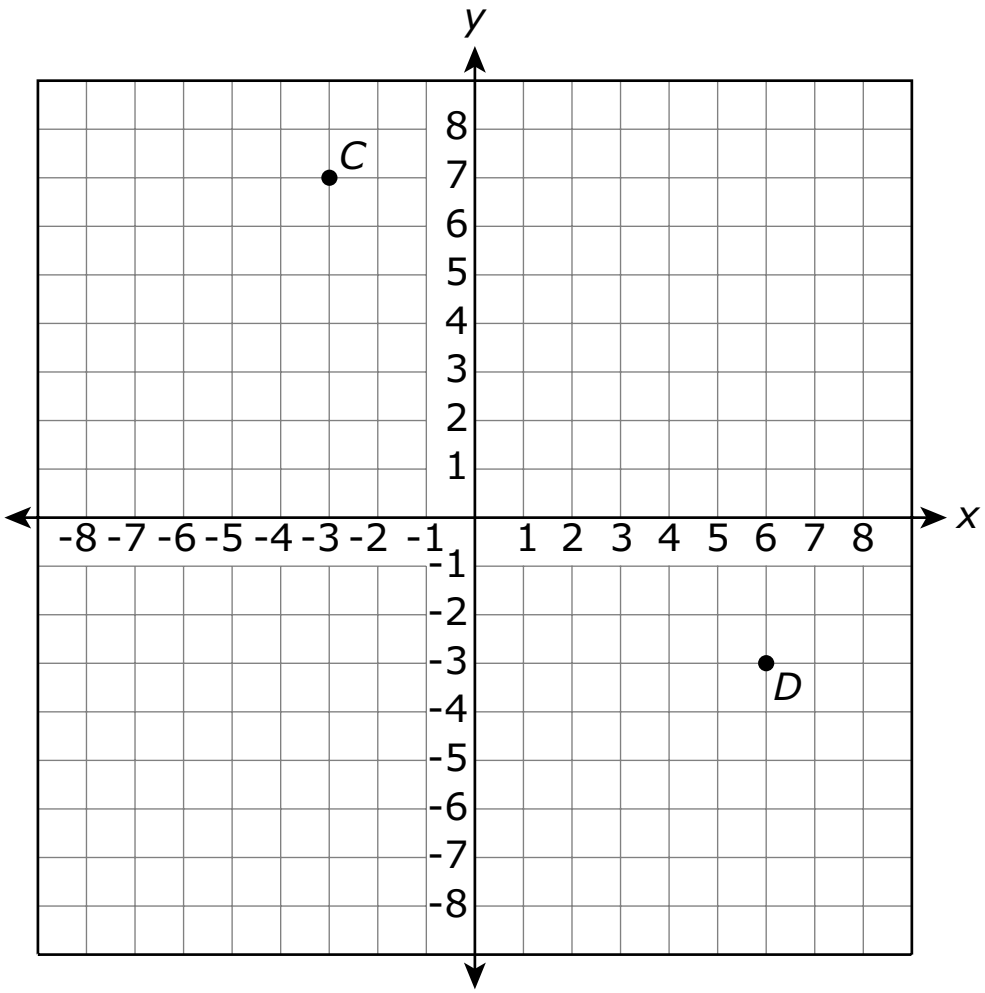
A. The truck travels 0.9 more miles per gallon of gas than the car.

B. The truck travels 1.1 more miles per gallon of gas than the car.

C. The car travels 0.9 more miles per gallon of gas than the truck.

D. The car travels 1.1 more miles per gallon of gas than the truck.

00. Points *C* and *D* are graphed on the coordinate plane.



To the nearest tenth, what is the distance between points *C* and *D*?

A. 4.4

B. 6.2

C. 13.5

D. 19.0

00. Which equation has exactly one solution?

Equation K **:** $3x + 1 = 2(x + 1) - x$
Equation L **:** $3x + 1 = 2(x + 1) + x$

A. Equation K

B. Equation L

C. Both equations

D. Neither equation

00. A right triangle has a hypotenuse of 12.4 millimeters. One leg of the triangle is 8.1 millimeters long.

How long is the other leg of the triangle, to the nearest tenth millimeter?

A. 2.1

B. 4.3

C. 9.4

D. 14.8

00. How is 152,000 written in scientific notation?

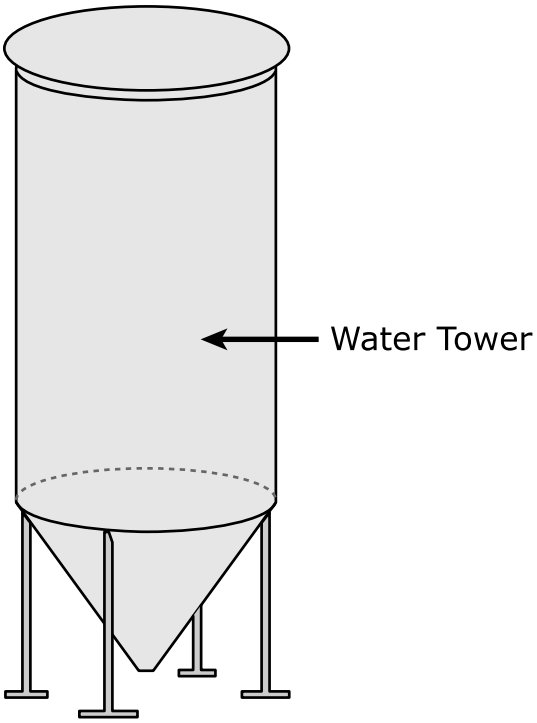
A. 1.52×10^{-5}

B. 1.52×10^{-3}

C. 1.52×10^{3}

D. 1.52×10^{5}

00. A full water tower is being drained of water.



The equation $y = -155x + 13{,}950$ can be used to model this situation where y is the number of gallons of water left in the tower after x minutes.

Based on this model, which statements are true?

Select the **two** correct answers.

A. The tower is completely drained in 90 minutes.

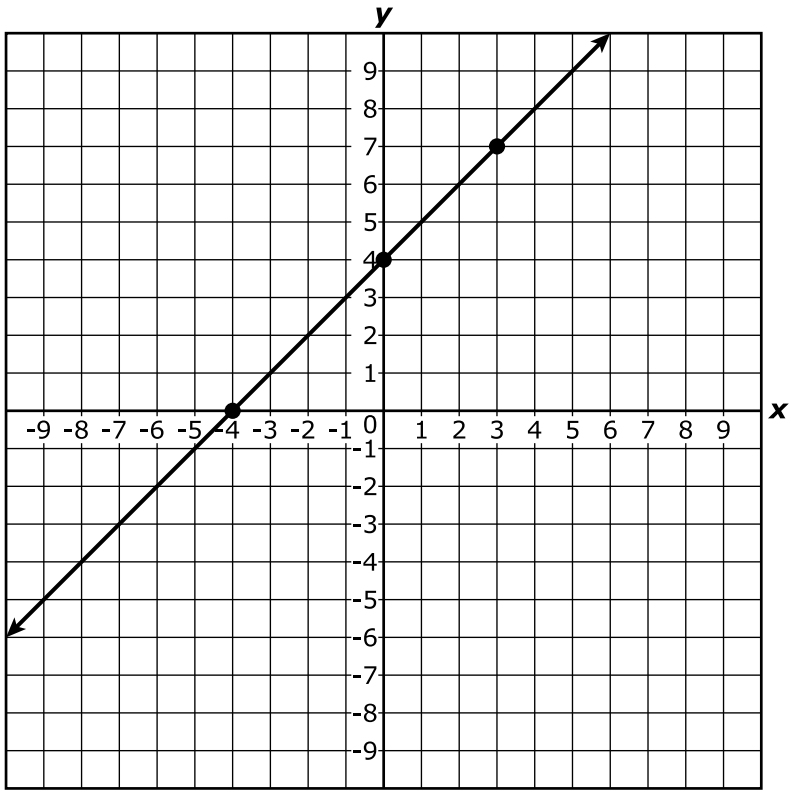
B. The maximum capacity of the tower is 14,105 gallons.

C. The tower is draining at a rate of 155 gallons per minute.

D. The slope of the line in the equation is 90.

E. The y-intercept represents the total number of minutes it takes for the tower to drain.

00. The graph of a line contains (−4, 0), (0, 4), and (3, 7).



What is the slope of the line?

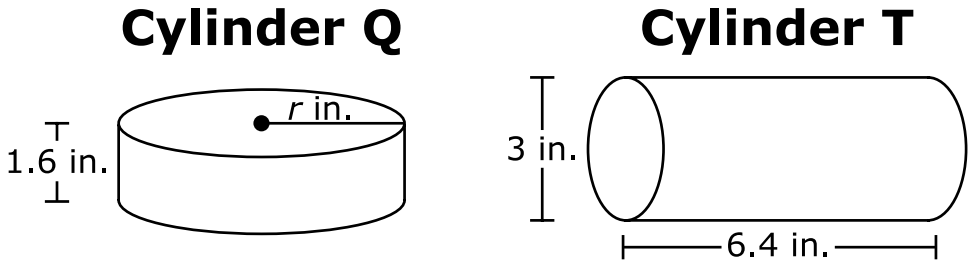
A. −7

B. −1

C. 1

D. 7

00. The dimensions of cylinder Q and cylinder T are shown in inches. The volume of cylinder Q is equal to the volume of cylinder T.



What is *r*, the radius of cylinder Q, in inches?

A. 3

B. 4

C. 6

D. 9

00. Which statement about the equation $3n - 4 = 3(n - 3)$ is true?

A. The equation has precisely one solution.

B. The equation has precisely two solutions.

C. The equation has infinitely many solutions.

D. The equation has no real solutions.

00. A right triangle has legs of length 4 units and 7 units.

What is the length of the hypotenuse of the triangle to the nearest tenth of a unit?

A. 3.0

B. 5.7

C. 8.1

D. 11.0

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