

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	■ ■ □

ID: 002dba45

2.1

Line k is defined by $y = -\frac{17}{3}x + 5$. Line j is perpendicular to line k in the xy -plane. What is the slope of line j ?

$$\begin{aligned} -1 &= \text{Slope } j \times \text{Slope } k \\ &= \frac{3}{17} // \times -\frac{17}{3} \end{aligned}$$

Question ID 9c7741c6

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ID: 9c7741c6

2.2

On a 210-mile trip, Cameron drove at an average speed of 60 miles per hour for the first x hours. He then completed the trip, driving at an average speed of 50 miles per hour for the remaining y hours. If $x = 1$, what is the value of y ?

$$\begin{aligned}S_T &= S_1 + S_2 \\210 &= 60x + 50y \\210 &= 60(1) + 50y \\y &= 3 //\end{aligned}$$

Question ID d62ad380

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ID: d62ad380

2.3

An artist paints and sells square tiles. The selling price P , in dollars, of a painted tile is a linear function of the side length of the tile s , in inches, as shown in the table below.

Side length, s (inches)	Price, P (dollars)
3	8.00
6	18.00
9	28.00

Which of the following could define the relationship between s and P ?

A. ~~$P = 3s + 10$~~

B. $P = \frac{10}{3}s + 8$

~~C. $P = \frac{10}{3}s - 2$~~

D. ~~$P = \frac{3}{10}s - \frac{1}{10}$~~

Desmos Y-intercept $\rightarrow \frac{10}{3}s - 2 = P$

Check Slope $\frac{18-8}{6-3} = \frac{10}{3}$

Check Y-intercept

$$y = mx + c$$

$$y = \frac{10}{3}x + c$$

$$8 = \frac{10}{3}(3) + c$$

$$c = -2$$

Question ID 431c3038

877

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ID: 431c3038

2.4

In an article about exercise, it is estimated that a 160-pound adult uses 200 calories for every 30 minutes of hiking and 150 calories for every 30 minutes of bicycling. An adult who weighs 160 pounds has completed 1 hour of bicycling. Based on the article, how many hours should the adult hike to use a total of 1,900 calories from bicycling and hiking?

A. 9.5

B. 8.75

C. 6

~~D. 4~~

$$200 \frac{\text{Cal}}{0.5h} + \left(150 \frac{\text{Cal}}{0.5h}\right) \frac{2}{2} = 1,900$$

$$200 \times \frac{\text{Cal}}{0.5h} + 300 \frac{\text{Cal}}{1h} = 1,900$$

~~X 1600~~

$$200 \times \frac{\text{Cal}}{0.5h} = 1,600$$

$$X = 8 \text{ hours}$$

$$\frac{8}{8} \left(200\right) \frac{\text{Cal}}{0.5h} = 1,600 \frac{\text{Cal}}{4 \text{ hours}}$$

Question ID 265f2a53

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ID: 265f2a53

2.5

When line n is graphed in the xy -plane, it has an x -intercept of $(-4, 0)$ and a y -intercept of $(0, \frac{86}{3})$. What is the slope of line n ?

- A. $\frac{3}{344}$
- B. $\frac{6}{43}$
- ☒ C. $\frac{43}{6}$
- D. $\frac{344}{3}$

$$\text{Slope} \rightarrow \frac{\frac{86}{3} - 0}{0 - (-4)} = \frac{43}{6} //$$

$$\text{Desmos} \rightarrow y = 15.33x + 28.67$$

Question ID f81a0503

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ID: f81a0503

2.6

In the xy -plane, line k passes through the points $(0, -5)$ and $(1, -1)$. Which equation defines line k ?

A. $y = -x + \frac{1}{4}$

B. $y = \frac{1}{4}x - 5$

C. $y = -x + 4$

~~D.~~ $y = \underline{4x} - 5$

$$\text{Check slope} = \frac{-1 - (-5)}{1 - 0} = 4 //$$

$$\text{Desmos} \rightarrow y = 4x - 5 //$$

Question ID 28c2253f

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ID: 28c2253f

2.7

Characteristics for Rock Types

Rock type	Weight per volume (lb/ft ³)	Cost per pound
<u>Basalt</u>	180	\$0.18
<u>Granite</u>	165	\$0.09
<u>Limestone</u>	120	\$0.03
Sandstone	135	\$0.22

A city is planning to build a rock retaining wall, a monument, and a garden in a park. The table above shows four rock types that will be considered for use in the project. Also shown for each rock type is its weight per volume, in pounds per cubic foot (lb/ft³), and the cost per pound, in dollars. Only basalt, granite, and limestone will be used in the garden. The rocks in the garden will have a total weight of 1,000 pounds. If 330 pounds of granite is used, which of the following equations could show the relationship between the amounts, x and y , in ft³, for each of the other rock types used?

- A. ~~$180x + 180y = 670$~~
- B. ~~$165x + 120y = 1,000$~~
- C. $120x + 180y = 670$
- D. ~~$120x + 180y = 1,000$~~

$$180y + 330 + 120x = 1,000$$

$$180y + 120x = 670 //$$

amount of granite 165 g = 330
 165 g = 2

Question ID 2e1a7f66

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ID: 2e1a7f66

2.8

Figure A and figure B are both regular polygons. The sum of the perimeter of figure A and the perimeter of figure B is **63** inches. The equation $3x + 6y = 63$ represents this situation, where x is the number of sides of figure A and y is the number of sides of figure B. Which statement is the best interpretation of **6** in this context?

- ☒ A. Each side of figure B has a length of **6** inches. 6
- ☐ B. The number of ~~sides~~ of figure B is **6**. y
- ☐ C. Each side of figure ~~A~~ has a length of ~~3~~ inches. 3
- ☐ D. The number of ~~sides~~ of figure A is **6**. x

$$\begin{array}{lcl}
 \text{Total } P_A & \rightarrow & 3x \\
 \text{Total } P_B & \rightarrow & 6y
 \end{array}
 \left. \vphantom{\begin{array}{lcl} \text{Total } P_A & \rightarrow & 3x \\ \text{Total } P_B & \rightarrow & 6y \end{array}} \right\} \text{ 66.2}$$

Question ID 6f6dfe3e

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ID: 6f6dfe3e

2.9

x	y
-6	$n + 184$
-3	$n + 92$
0	n

The table shows three values of x and their corresponding values of y , where n is a constant, for the linear relationship between x and y . What is the slope of the line that represents this relationship in the xy -plane?

~~A.~~ $-\frac{92}{3}$

B. $-\frac{3}{92}$

C. ~~$\frac{n+92}{-3}$~~

D. ~~$\frac{2n-92}{3}$~~

$$\frac{n - (n + 92)}{0 - (-3)} = -\frac{92}{3}$$

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Question ID 9ed4c1a2

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ID: 9ed4c1a2

2.10

What is the slope of the graph of $y = \frac{1}{4}(27x + 15) + 7x$ in the xy -plane?

$$\begin{aligned}
 y &= \frac{27}{4}x + \frac{15}{4} + 7x \\
 &= \frac{55}{4}x + \frac{15}{4} \\
 &= 13.75x + 3.75
 \end{aligned}
 \quad \left| \quad
 \begin{aligned}
 &\frac{27}{4} + 7 \\
 &= \frac{55}{4} \\
 &= 13.75
 \end{aligned}$$

Question ID fb43b85f

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ID: fb43b85f

2.11

A line passes through the points $(4, 6)$ and $(15, 24)$ in the xy -plane. What is the slope of the line?

Desmos $\rightarrow y = 1.636x - 0.545$

Slope $\frac{24 - 6}{15 - 4} = \frac{18}{11} //$

Question ID 400798d6

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ID: 400798d6

2.12

$2x + y = 37$

In triangle *QRS*, sides *QR* and *RS* each have a length of x centimeters and side *SQ* has a length of y centimeters. The given equation represents this situation. Which of the following is the best interpretation of 37 in this context?

- A. The difference, in centimeters, between the lengths of sides *QR* and *SQ*

B. The difference, in centimeters, between the lengths of sides *QR* and *RS*

☒

C. The sum of the lengths, in centimeters, of the three sides of the triangle

D. The length, in centimeters, of one of the two sides of equal length
- X

$x - y / y - x / |x - y|$
- X

0

$/ |y - x|$

Difference between _____ and _____ .
จะให้ค่า + / 0 เท่านั้น

Question ID ca452900

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ID: ca452900

2.13

What is the slope of the graph of $y = \frac{5x}{13} - 23$ in the xy -plane?

slope = $\frac{5}{13}$ //

Question ID 62ef6f73

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ID: 62ef6f73

2.14

A total of 2 squares each have side length r . A total of 6 equilateral triangles each have side length t . None of these squares and triangles shares a side. The sum of the perimeters of all these squares and triangles is 210. Which equation represents this situation?

- A. $6r + 24t = 210$
- B. $2r + 6t = 210$
- ~~C. $8r + 18t = 210$~~
- D. $6r + 2t = 210$

$2(4r) + 6(3t) = 210$
 $8r + 18t = 210 //$

Question ID 92aa3a94

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ID: 92aa3a94

2.15

Line k is defined by $y = 7x + \frac{1}{8}$. Line j is perpendicular to line k in the xy -plane. What is the slope of line j ?

- A. -8
- ~~B. $-\frac{1}{7}$~~
- C. $\frac{1}{8}$
- D. 7

$$\text{slope } k \times \text{slope } j = -1$$
$$7 \times -\frac{1}{7} = -1$$
$$//$$