

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	

ID: e62cfe5f

2.1

According to a model, the head width, in millimeters, of a worker bumblebee can be estimated by adding 0.6 to four times the body weight of the bee, in grams. According to the model, what would be the head width, in millimeters, of a worker bumblebee that has a body weight of 0.5 grams?

$$\begin{aligned}y &= 0.6 + 4x \\&= 0.6 + 4(0.5) \\&= 2.6 \quad //\end{aligned}$$

Question ID 7e3f8363

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ID: 7e3f8363

2.2

In the xy -plane, the graph of the linear function f contains the points $(0, 3)$ and $(7, 31)$. Which equation defines f , where $y = f(x)$?

- A. $f(x) = \cancel{2}x + 34$
- B. $f(x) = \cancel{x} + 38$
- ~~C.~~ $f(x) = \cancel{4}x + 3$
- D. $f(x) = \cancel{x} + 3$

Desmos $\rightarrow 4x + 3$

Check Slope $\frac{31 - 3}{7 - 0} = 4$

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Question ID 620fe971

Assessment	Test	Domain	Skill	Difficulty
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ID: 620fe971

2.3

A team of workers has been moving cargo off of a ship. The equation below models the approximate number of tons of cargo, y , that remains to be moved x hours after the team started working.

$$y = 120 - 25x$$

The graph of this equation in the xy -plane is a line. What is the best interpretation of the x -intercept in this context?

☒ A. The team will have moved all the cargo in about 4.8 hours.

B. The team has been moving about 4.8 tons of cargo per hour.

C. The team has been moving about 25 tons of cargo per hour.

D. The team started with 120 tons of cargo to move.

4.8

slope unit

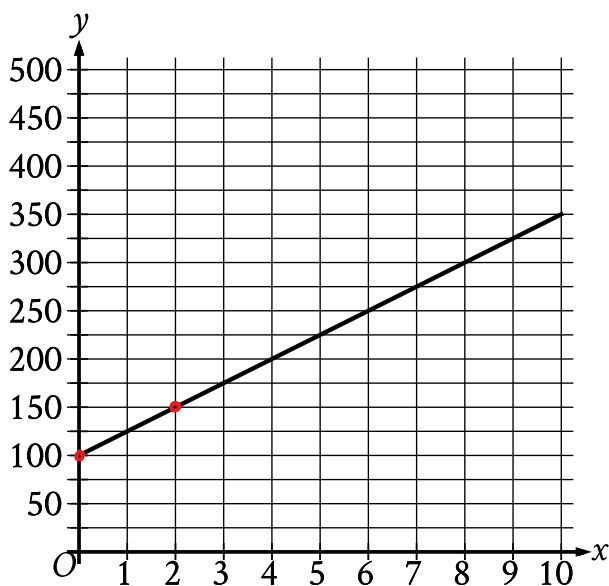
y-intercept

Question ID 5cf1bbc9

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	<div> <div></div> <div></div> <div></div> </div>

ID: 5cf1bbc9

2.4



$(0, 100), (2, 150)$

The graph of the function f , where $y = f(x)$, gives the total cost y , in dollars, for a certain video game system and x games. What is the best interpretation of the slope of the graph in this context?

~~A~~ Each game costs \$25.

B. The video game system costs ~~\$100~~.

C. The video game system costs ~~\$25~~.

D. Each game costs \$100.

y intercept

$$\text{Slope} = \frac{150 - 100}{2 - 0} = 25 //$$

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Question ID dae126d7

Assessment	Test	Domain	Skill	Difficulty
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ID: dae126d7

2.5

The boiling point of water at sea level is 212 degrees Fahrenheit ($^{\circ}\text{F}$). For every 550 feet above sea level, the boiling point of water is lowered by about 1 $^{\circ}\text{F}$. Which of the following equations can be used to find the boiling point B of water, in $^{\circ}\text{F}$, x feet above sea level?

A. ~~$B = 550 + \frac{x}{212}$~~

B. ~~$B = 550 - \frac{x}{212}$~~

C. ~~$B = 212 + \frac{x}{550}$~~

~~$B = 212 - \frac{x}{550}$~~

$(0, 212)$

$x \uparrow$ $y \downarrow$

Slope $(-)$

y 7m50y

x

y

Question ID 271f7e3f

Assessment	Test	Domain	Skill	Difficulty
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ID: 271f7e3f

2.6

$$f(x) = \frac{(x+7)}{4}$$

For the function f defined above, what is the value of $f(9) - f(1)$?

A. 1

~~B. 2~~

C. $\frac{1}{4}$

D. $\frac{9}{4}$

$$\frac{9+7}{4} - \frac{1+7}{4} = 2 //$$

Question ID c651cc56

Assessment	Test	Domain	Skill	Difficulty
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ID: c651cc56

2.7

x	$f(x)$
0	<u>-2</u>
2	4
6	16

Some values of the linear function f are shown in the table above. What is the value of $f(3)$?

A. 6

~~B. 7~~

C. 8

D. 9

$$\text{Desmos} \rightarrow 3x - 2 \rightarrow 3(3) - 2 = 7 //$$

$$\text{Slope} = \frac{4 - (-2)}{2 - 0} = 3$$

$$y = 3x - 2$$

$$y = 3(3) - 2 = 7 //$$

Question ID c22b5f25

Assessment	Test	Domain	Skill	Difficulty
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ID: c22b5f25

2.8

In the xy -plane, the points $(-2, 3)$ and $(4, -5)$ lie on the graph of which of the following linear functions?

A. $f(x) = \cancel{x} + 5$

B. $f(x) = \cancel{\frac{1}{2}}x + 4$

$\cancel{x}$. $f(x) = -\frac{4}{3}x + \frac{1}{3}$

D. $f(x) = \cancel{-\frac{3}{2}}x + 1$

Desmos $\rightarrow -1.33X + 0.33$

Check Slope = $\frac{-5 - 3}{4 - (-2)} = -\frac{4}{3}$

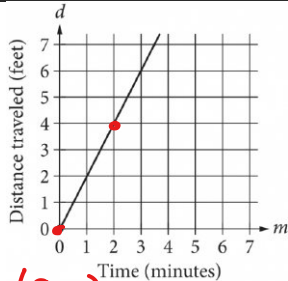
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Question ID 11e1ab81

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ID: 11e1ab81

2.9



$(0,0)$

The graph above shows the distance traveled d , in feet, by a product on a conveyor belt m minutes after the product is placed on the belt. Which of the following equations correctly relates d and m ?

~~A. $d = 2m$~~

B. ~~$d = \frac{1}{2}m$~~

C. ~~$d = m + 2$~~

D. ~~$d = 2m + 2$~~

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Check Slope $\frac{4-0}{2-0} = 2$

Question ID 4fe4fd7c

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ID: 4fe4fd7c

2.10

$$c(x) = mx + 500$$

A company's total cost $c(x)$, in dollars, to produce x shirts is given by the function above, where m is a constant and $x > 0$. The total cost to produce 100 shirts is \$800. What is the total cost, in dollars, to produce 1000 shirts? (Disregard the \$ sign when gridding your answer.)

(100, 800)

$$800 = m(100) + 500$$

$$m = 3$$

$$\begin{aligned}
 y &= 3x + 500 \\
 &= 3(1,000) + 500 \\
 &= 3,500 //
 \end{aligned}$$

Question ID 3122fc7b

Assessment	Test	Domain	Skill	Difficulty
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ID: 3122fc7b

2.11

A linear model estimates the population of a city from **1991** to **2015**. The model estimates the population was 57 thousand in **1991**, 224 thousand in **2011**, and x thousand in **2015**. To the nearest whole number, what is the value of x ?

$$\begin{aligned}
 &\text{Slope}_1 = \text{Slope}_2 \\
 \text{Collinear} &= \frac{224 - 57}{2011 - 1991} = \frac{x - 57}{2015 - 1991} \quad \leftarrow \text{Desmos} \\
 &\frac{167}{20} = \frac{x - 57}{24} \\
 x &= 257.4 \\
 &\approx 257 //
 \end{aligned}$$

Question ID c01f4a95

Assessment	Test	Domain	Skill	Difficulty
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ID: c01f4a95

2.12

$$j(x) = mx + 144$$

For the linear function j , m is a constant and $j(12) = 18$. What is the value of $j(10)$?

$$18 = 12m + 144$$

$$m = -10.5$$

$$\begin{aligned} y &= -10.5x + 144 \\ j &= -10.5(10) + 144 \\ &= 39 // \end{aligned}$$

Question ID 868fc236

Assessment	Test	Domain	Skill	Difficulty
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ID: 868fc236

2.13

Energy per Gram of Typical Macronutrients

Macronutrient	Food calories	Kilojoules
Protein	4.0	16.7
Fat	9.0	37.7
Carbohydrate	4.0	16.7

The table above gives the typical amounts of energy per gram, expressed in both food calories and kilojoules, of the three macronutrients in food. If x food calories is equivalent to k kilojoules, of the following, which best represents the relationship between x and k ?

- A. ~~$k = 0.24x$~~ } $y = k$ แทนค่าไม่ถูก
 ~~$k = 4.2x$~~
 C. $x = 4.2k$
 D. $xk = 4.2$ ✗

Question ID 042aa429

Assessment	Test	Domain	Skill	Difficulty
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ID: 042aa429

2.14

If $f(x) = x + 7$ and $g(x) = 7x$, what is the value of $4f(2) - g(2)$?

A. -5

B. 1

~~C. 22~~

D. 28

$$4(2+7) - 7(2) = 22 //$$

Question ID 113b938e

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■ ■ □

ID: 113b938e

2.15

$$y = 18 - 5x$$

The equation above represents the speed y , in feet per second, of Sheila's bicycle x seconds after she applied the brakes at the end of a ride. If the equation is graphed in the xy -plane, which of the following is the best interpretation of the x -coordinate of the line's x -intercept in the context of the problem?

- A. The speed of Sheila's bicycle, in feet per second, before Sheila applied the brakes
- B. The number of feet per second the speed of Sheila's bicycle decreased each second after Sheila applied the brakes
- ~~C.~~ The number of seconds it took from the time Sheila began applying the brakes until the bicycle came to a complete stop
- D. The number of feet Sheila's bicycle traveled from the time she began applying the brakes until the bicycle came to a complete stop

$$y = 0$$

3.6 ไม่มีตัวเลข

y-intercept

Slope

ไม่เกี่ยวข้อง

Question ID 441558e7

Assessment	Test	Domain	Skill	Difficulty
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ID: 441558e7

2.16

Scientists collected fallen acorns that each housed a colony of the ant species *P. ohioensis* and analyzed each colony's structure. For any of these colonies, if the colony has x worker ants, the equation $y = 0.67x + 2.6$, where $20 \leq x \leq 110$, gives the predicted number of larvae, y , in the colony. If one of these colonies has 58 worker ants, which of the following is closest to the predicted number of larvae in the colony?

$x = 58$

~~A. 41~~

B. 61

C. 83

D. 190

$$\begin{aligned}
 y &= 0.67(58) + 2.6 \\
 &= 41.46 \\
 &\approx 41
 \end{aligned}$$

Question ID 8a6de407

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	<div><div></div><div></div><div></div></div>

ID: 8a6de407

2.17

The function f is defined by $f(x) = mx + b$, where m and b are constants. If

$f(0) = 18$ and $f(1) = 20$, what is the value of m ?

$$18 = m(0) + b$$

$$18 = b$$

$$y = mx + 18$$

$$20 = m + 18$$

$$m = 2 //$$

Question ID 41fdc0b8

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	<div> <div></div> <div></div> <div></div> </div>

ID: 41fdc0b8

2.18

Population of Greenleaf, Idaho

Year	Population
2000	862
2010	846

The table above shows the population of Greenleaf, Idaho, for the years 2000 and 2010. If the relationship between population and year is linear, which of the following functions P models the population of Greenleaf t years after 2000? !?

✗ A. $P(t) = 862 - 1.6t$

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B. $P(t) = 862 - 16t$

C. $P(t) = 862 + 16(t - 2,000)$

D. $P(t) = 862 - 1.6(t - 2,000)$

$t = 10 \rightarrow$ ไม่ตรงกับโจทย์

Check Slope = $\frac{846 - 862}{2010 - 2000}$
= -1.6

Assessment	Test	Domain	Skill	Difficulty
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ID: 1c29bfd1

2.19

The pressure exerted on a scuba diver at sea level is **14.70 pounds per square inch (psi)**. For each foot the scuba diver descends below sea level, the pressure exerted on the scuba diver increases by **0.44 psi**. What is the total pressure, in **psi**, exerted on the scuba diver at 105 feet below sea level?

~~A. 60.90~~

B. 31.50

C. 14.70

D. 0.44

y-intercept

Slope (+)

$$y = -0.44x + 14.7$$
$$= -0.44(105) + 14.7$$
$$= 31.5 \text{ ถ้า } x \text{ เป็น ความลึกจากระดับ น้ำทะเล}$$

$$y = 0.44x + 14.7$$
$$= 0.44(105) + 14.7$$
$$= 60.9 //$$

Question ID 295a41f0

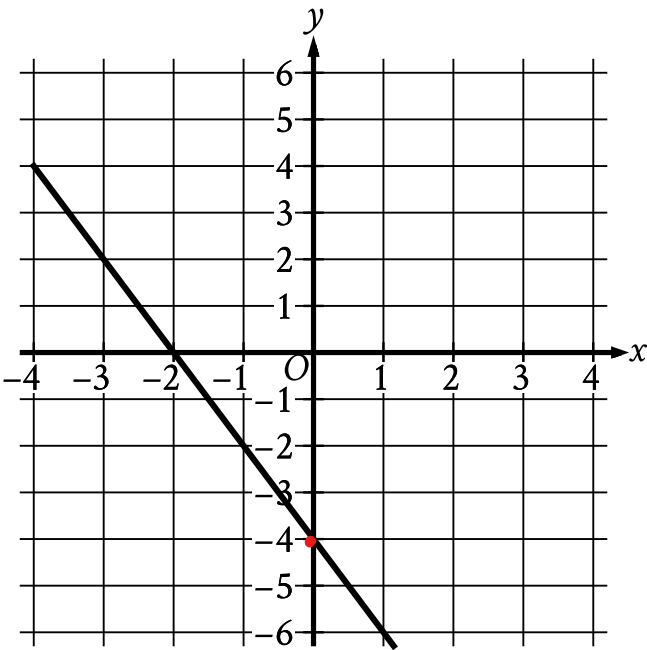
Assessment	Test	Domain	Skill	Difficulty
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ID: 295a41f0

กราฟเลื่อน shift down

2.20

The graph of $y = f(x) - 11$ is shown.



Slope (-)
y-intercept = -4 } กราฟ

Which equation defines the linear function f ?

- A. $f(x) = -13x - 11$
- ~~B. $f(x) = -2x + 7$~~
- C. $f(x) = -13x + 7$
- D. $f(x) = -2x - 11$

Desmos กราฟ $(-2, 0), (0, -4)$

$y = -2x - 4$

$-2x - 4 = f(x) - 11$
 $f(x) = -2x + 7 //$

Question ID 2f34cd1c

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	<div><div></div><div></div><div></div></div>

ID: 2f34cd1c

2.21

The function $f(x) = 55.20 - 0.16x$ gives the estimated surface water temperature $f(x)$, in degrees Celsius, of a body of water on the x th day of the year, where $220 \leq x \leq 360$. Based on the model, what is the estimated surface water temperature, in degrees Celsius, of this body of water on the 326th day of the year?

- A. 55.20
- ~~B. 3.04~~
- C. -0.16
- D. -52.16

$$\begin{aligned} y &= 55.20 - 0.16(326) \\ &= 3.04 \end{aligned}$$