Identifying Slope of a Line

October 15, 2013

1 x36bf4ab2

Dominique from Dominique's Pizza wanted to know how much electricity it takes to bake 1 pizza. She checked her electricity meter three times in one day. Each time she also recorded the number of pizzas baked until then.

Assuming the relationship has a constant rate of change, find the exact value of this rate of change using the following table:

Pizzas baked — Electricity Meter (in kWh*) :-:—:-:—:-:— 8 — 11,563 23 — 11,581 48 — 11,611 *kWh is a measurement unit of energy

Ans It takes [[? input-number 1]] kWh to bake 1 pizza. 1.2

Hint 1 The first row tells us that when 8 pizzas were baked, the meter was showing 11,563 kWh. The third row tells us that when 48 pizzas were baked, the meter was showing 11,611 kWh.

$48 - 8 = 40$

$11{,}611 - 11{,}563 = 48$

Therefore, it took 48 kWh to bake 40 pizzas. Now let's find how much kWh it takes to bake 1 pizza.

Hint 2

$$\frac{48}{40} = \frac{\cancel{8} \cdot 6}{\cancel{8} \cdot 5} \quad (1)$$

$$= \frac{6}{5} \quad (2)$$

$$= 1\frac{1}{5} \quad (3)$$

$$= 1.2 \quad (4)$$

Hint 3 **It takes 1.2 kWh to bake 1 pizza.**

Note that what we did was like finding the slope of a line that passes through the points $(8, 11{,}563)$ and $(48, 11{,}611)$, where the x-axis represents the number of pizzas baked and the y-axis represents the electricity meter.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.2, Slope of a line.1
Version: c6715972.. 2013-10-14

2 x4e3f10ba

Joshuas grandmother has an exotic snake that grows the same amount every day. The first time Joshua saw the snake it was 2 feet long. The last time was 15 months later and the snake was 8 feet long.

What is the rate of change of the snakes length?

Ans The snake grows [[? input-number 1]] feet per month. 0.4

Hint 1 The first time Joshua saw the snake it was 2 feet long, and 15 months later, it was 8 feet long. Therefore, the change in time is 15 months, and the change in length is:

$8 - 2 = 6$ feet

Now let's find the number of feet the snake grows in exactly 1 month.

Hint 2

$$\frac{6}{15} = \frac{\cancel{3} \cdot 2}{\cancel{3} \cdot 5} = \frac{2}{5}$$

Hint 3 **The snake grows $\frac{2}{5}$ feet per month.**

Note that what we did was like finding the slope of a line that passes through the points $(0, 2)$ and $(15, 8)$,where the x-axis represents the time in months from today, and the y-axis represents the length of the snake.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.2, Slope of a line.1
Version: 2924dd50.. 2013-10-14

3 x84a31073

The table below describes the price of a train ticket according to the number of stops traveled.

Assuming the relationship between number of stops and price has a constant rate of change, find the value of this rate of change.

# of Stops — Price ($) :-:—:-:—:-:— 7 — 40.60 15— 87 21 — 121.80

Ans The price of the ticket increases by $[[? input-number 1]] per stop. 5.8

Hint 1 The first row tells us that a ticket for traveling 7 stops costs $40.60. The second row tells us that a ticket for traveling 15 stops costs $87.

$15 - 7 = 8$

$87 - 40.60 = \$46.40$

Therefore, an increase of 8 stops increases the price by $46.40. Now let's find the increase in price for an increase of 1 stop.

Hint 2

$$\frac{46.40}{8} = \frac{10 \cdot 46.40}{10 \cdot 8} \tag{5}$$
$$= \frac{464}{80} \tag{6}$$
$$= \frac{\cancel{16} \cdot 29}{\cancel{16} \cdot 5} \tag{7}$$
$$= \frac{29}{5} \tag{8}$$
$$= \$5.80 \tag{9}$$

.

Hint 3 **The price of the ticket increases by $5.80 per stop.**

Note that what we did was like finding the slope of a line that passes through the points $(7, 40.6)$ and $(15, 87)$, where the x-axis represents the number of stops and the y-axis represents the price.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.2, Slope of a line.1
Version: 6e777cab.. 2013-10-14

4 x9bf130ee

Dominic from Dominic's Pizza wanted to know how much electricity it takes to bake 1 pizza. He checked his electricity meter at the beginning of the day and two more times that day. Each time he also recorded the number of pizzas baked until then.

Assuming the relationship has a constant rate of change, find the exact value of this rate of change using the following table:

Pizzas baked — Electricity Meter (in kWh*) :-:—:-:—:-:— 0 — 23,100 15 — 23,110 27 — 23,118 *kWh is a measurement unit of energy

Ans It takes [[? input-number 1]] kWh to bake 1 pizza. 0.6666666666666666

Hint 1 The second row tells us that when 15 pizzas were baked, the meter was showing 23,110 kWh. The third row tells us that when 27 pizzas were baked, the meter was showing 23,118 kWh.

$27 - 15 = 12$

$23{,}118 - 23{,}110 = 8$

Therefore, it took 8 kWh to bake 12 pizzas. Now let's find how much kWh it takes to bake 1 pizza.

Hint 2

$$\frac{8}{12} = \frac{\cancel{4} \cdot 2}{\cancel{4} \cdot 3} \tag{10}$$
$$= \frac{2}{3} \tag{11}$$

Hint 3 **It takes $\frac{2}{3}$kWh to bake 1 pizza.**

Note that what we did was like finding the slope of a line that passes through the points $(15, 23{,}110)$ and $(27, 23{,}118)$, where the x-axis represents the number of pizzas baked and the y-axis represents the electricity meter.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.2, Slope of a line.1
Version: ce0fa92e.. 2013-10-14

5 xc6e4d9c8

Jane's grandson has an exotic snake that grows the same amount every day. Today the snake is 22 feet long. The last time Jane saw the snake before today was 7 months ago, when it was 12 feet long.

What is the rate of change of the snakes length?

Ans The snake grows [[? input-number 1]] feet per month. 1.4285714285714286

Hint 1 7 months ago, the snake was 12 feet long, and today it's 22 feet long. Therefore, the change in time is 7 months, and the change in length is:

$22 - 12 = 10$ feet

Now let's find the number of feet the snake grows in exactly 1 month.

Hint 2 $\frac{10}{7} = 1\frac{3}{7}$

Hint 3 **The snake grows $1\frac{3}{7}$ feet per month.**

Note that what we did was like finding the slope of a line that passes through the points $(-7, 12)$ and $(0, 22)$,where the x-axis represents the time in months from today (therefore 7 months *ago* are considered -7), and the y-axis represents the length of the snake.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.2, Slope of a line.1
Version: 6364e761.. 2013-10-14

6 xccc16e2f

The table below describes the price of a train ticket according to the number of stops traveled.

Assuming the relationship between number of stops and price has a constant rate of change, find the value of this rate of change.

# of Stops — Price ($) :-:—:-:—:-:— 6 — 35 14— 77 22 — 119

Ans The price of the ticket increases by $[[? input-number 1]] per stop. 5.25

Hint 1 The first row tells us that a ticket for traveling 6 stops costs $35. The second row tells us that a ticket for traveling 14 stops costs $77.

$14 - 6 = 8$

$77 - 35 = \$42$

Therefore, an increase of 8 stops increases the price by \$42. Now let's find the increase in price for an increase of 1 stop.

Hint 2

$$\begin{aligned}\frac{42}{8} &= \frac{\cancel{2}\cdot 21}{\cancel{2}\cdot 4}\\ &= \frac{21}{4}\\ &= 5\frac{1}{4}\\ &= \$5.25\end{aligned}$$

.

Hint 3 **The price of the ticket increases by \$5.25 per stop.**

Note that what we did was like finding the slope of a line that passes through the points $(6, 35)$ and $(14, 77)$, where the x-axis represents the number of stops and the y-axis represents the price.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.2, Slope of a line.1
Version: 9f61255f.. 2013-10-14

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7 xda8887e6

Anne wanted to know just how efficient is her car's fuel consumption. When her fuel tank had 30 gallons of fuel she checked the car mileage and it was 1263 miles. When her fuel tank had 19 gallons of fuel, the mileage was 1560 miles.

Assuming the fuel consumption is constant, find its rate of change.

Ans Anne's car can drive [[? input-number 1]] MPS (miles per gallon). 27

Hint 1 When the amount of fuel was 30 gallons, the mileage was 1263 miles. When the amount of fuel was 19 gallons, the mileage was 1560 miles.

$1560 - 1263 = 297$

So the change in distance is 693 miles. In order to find the amount of fuel consumed, we need to subtract the opposite values, since the fuel meter tell us how much we *have* and not how much we *use*:

$30 - 19 = 11$

Therefore, the car consumed 11 gallons of fuel while driving 297 miles. Now let's find the number of miles it takes to consume exactly 1 gallon.

Hint 2 $\frac{297}{11} = 27$

Hint 3 **Anne's car can drive 27 MPS (miles per gallon).**

Note that what we did was like finding the *absolute value* of the slope of a line that passes through the points $(30, 1263)$ and $(19, 1560)$, where the x-axis represents the fuel meter and the y-axis represents mileage.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.2, Slope of a line.1
Version: bb2d4210.. 2013-10-14

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8 xf79b4711

Elijah wanted to know just how efficient is his car's fuel consumption. When his fuel tank had 45 gallons of fuel he checked the car mileage and it was 930 miles. When his fuel tank had 24 gallons of fuel, the mileage was 1623 miles.

Assuming the fuel consumption is constant, find its rate of change.

Ans Elijah's car can drive [[? input-number 1]] MPS (miles per gallon). 33

Hint 1 When the amount of fuel was 45 gallons, the mileage was 930 miles. When the amount of fuel was 24 gallons, the mileage was 1623 miles.

$1623 - 930 = 693$

So the change in distance is 693 miles. In order to find the amount of fuel consumed, we need to subtract the opposite values, since the fuel meter tell us how much we *have* and not how much we *use*:

$45 - 24 = 21$

Therefore, the car consumed 21 gallons of fuel while driving 693 miles. Now let's find the number of miles it takes to consume exactly 1 gallon.

Hint 2 $\frac{693}{21} = 33$

Hint 3 **Elijah's car can drive 33 MPS (miles per gallon).**

Note that what we did was like finding the *absolute value* of the slope of a line that passes through the points $(45, 930)$ and $(24, 1623)$, where the x-axis represents the fuel meter and the y-axis represents mileage.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.2, Slope of a line.1
Version: ee2f0eab.. 2013-10-14

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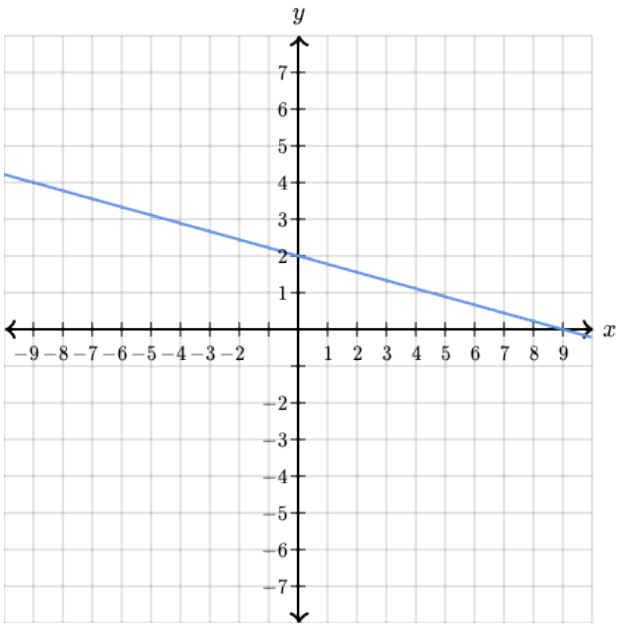
9 x394b867e

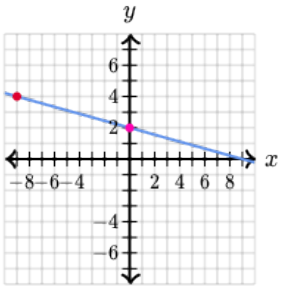
Determine which function corresponds to the following graph by finding the rate of change of the graph.



Ans $\boxed{y = 2 - \frac{2}{9}x}$

$y = 2 + \frac{2}{9}x$
$y = 2 - \frac{9}{2}x$
$y = 2 + \frac{9}{2}x$

Hint 1 Let's find the rate of change of the graph, which is also what we call the *slope* of the graph. We need the exact coordinates of two points the graph passes through, so let's find two points whose values are integers. There are several points like this. We will use $(-9, 4)$ and $(0, 2)$.



Hint 2 The formula of the slope of the graph is **rise over run**, or in other words: (change in y)/(change in x).

$$\frac{2-4}{0-(-9)} = \frac{-2}{9} \tag{12}$$

$$= -\frac{2}{9} \tag{13}$$

Therefore, the rate of change is $-\frac{2}{9}$.

Hint 3 The only function that has the correct rate of change is: $y = 2 - \frac{2}{9}x$ Therefore, this is the correct function.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.2
Version: 3a58040a.. 2013-10-14

10 x4f06de3c

Paprika the baker likes her bread spicy. For every 6 grams of table salt she uses, she adds 21 grams of chili.

Assuming the relationship is *not* proportional, which function can represent the relationship between the amount of table salt in grams, T, and the amount of chili in grams, C?

Ans $\boxed{C = 21 + \frac{7}{2}T}$

$C = \frac{7}{2}T$
$C = \frac{6}{21}T$
$C = 6 + \frac{2}{7}T$

Hint 1 We know that for every 6 grams of table salt she uses, Paprika adds 21 grams of chili. So how many grams of chili will she add to 1 gram of table salt?

Hint 2

$$\frac{21}{6} = \frac{\cancel{3}\cdot 7}{\cancel{3}\cdot 2} \tag{14}$$

$$= \frac{7}{2} \tag{15}$$

The rate of change is $\frac{7}{2}$.

There are *two* functions with this rate of change: $C = \frac{7}{2}T$ and $C = 21 + \frac{7}{2}T$

How do we decide which is the correct function?

Hint 3 Remember that we are told the relationship is *not proportional*. Since the first equation represents a proportional relationship, we must rule it out.

Hint 4 The only function with the correct rate of change that does not represent a proportional relationship is: $C = 21 + \frac{7}{2}T$ Therefore, this is the correct function.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.2
Version: 5ecb3552.. 2013-10-14

11 x645810e2

"Yak" travel agency came out with a special offer for Mountain Everest - pay as you climb! The table below describes the relationship between the altitude of the climb and the price to pay to get there.

Assuming the rate of change is constant, which function can represent the price paid for climbing, P, as a function of the altitude in meters, A?

Altitude (meters) — Price ($) :-:—:-:—:-:— 5364 (South Base Camp) — 300 7436 — 559 8848 (the summit!)— 735.50

Ans $P = 300 + 8A$

$P = 735\frac{1}{2} - \frac{1}{8}A$

$\boxed{P = \frac{1}{8}A - 370\frac{1}{2}}$

$P = 5362 - 8A$

Hint 1 The first row tells us that to get to an altitude of 5364 meters, the price is $300. The second row tells us that to get to an altitude of 7436 meters, the price is $559.

$7436 - 5364 = 2072$

$559 - 300 = 259$

Therefore, an increase of 2072 meters in altitude increases the price by $259. Now let's find the increase in price for an increase of 1 meter in altitude.

Hint 2

$$\frac{259}{2072} = \frac{\cancel{259}}{\cancel{259} \cdot 8} = \frac{1}{8}$$

So the rate of change is $\frac{1}{8}$. Note that what we did was like finding the slope of the line that passes through the points (5364 , 300) and (7436 , 559).

Hint 3 The only function with the above rate of change is: $P = \frac{1}{8}A - 370\frac{1}{2}$ Therefore, this is the correct function.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.2
Version: f0fe9517.. 2013-10-14

12 x6b4b74a2

Archimedes is draining his bathtub. Every 2 minutes that pass, 7 gallons of water are drained.

Which function can represent the number of gallons of water in the tub, W, as a function of the minutes that have passed, T?

Ans $W = \frac{2}{7}T$

$W = \frac{2}{7}T + 20$

$\boxed{W = 50 - \frac{7}{2}T}$

$W = 100 + \frac{7}{2}T$

Hint 1 We know that every 2 minutes that pass, 7 gallons of water are drained. So how many gallons of water are drained in 1 minute?

Hint 2 $\frac{7}{2}$ gallons of water are drained in 1 minute. Is this the rate of change of the relationship?

Hint 3 $\frac{7}{2}$ gallons is the amount that is *drained*, which means the actual amount of water in the tub *decreases* as time increases. Therefore, the correct rate of change is $-\frac{7}{2}$.

Hint 4 **The only function with this rate of change is: $W = 50 - \frac{7}{2}T$ Therefore, this is the correct function.**

Note that the initial term of the function is 50, which means that at the beginning of the draining (when $T = 0$) there were 50 gallons of water in the tub.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.2
Version: 237ddebe.. 2013-10-14

13 x6e7b81bf

Archimedes is draining his bathtub. Every 6 minutes that pass, 33 gallons of water are drained.

Which function can represent the number of gallons of water in the tub, W, as a function of the minutes that have passed, T?

Ans $W = \frac{33}{6}T$

$W = \frac{2}{11}T + 27$

$\boxed{W = 62 - \frac{11}{2}T}$

$W = 47 - \frac{2}{11}T$

Hint 1 We know that every 6 minutes that pass, 33 gallons of water are drained. So how many gallons of water are drained in 1 minute?

Hint 2

$$\frac{33}{6} = \frac{\cancel{3} \cdot 11}{\cancel{3} \cdot 2} = \frac{11}{2}$$

$\frac{11}{2}$ gallons of water are drained in 1 minute. Is this the rate of change of the relationship?

Hint 3 $\frac{11}{2}$ gallons is the amount that is *drained*, which means the actual amount of water in the tub *decreases* as time increases. Therefore, the correct rate of change is $-\frac{11}{2}$.

Hint 4 **The only function with this rate of change is: $W = 62 - \frac{11}{2}T$ Therefore, this is the correct function.**

Note that the initial term of the function is 62, which means that at the beginning of the draining (when $T = 0$) there were 62 gallons of water in the tub.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.2
Version: be725829.. 2013-10-14

14 x75022488

The table below describes the relationship between A, the altitude above sea level (in meters), and T, the temperature corresponding to that altitude (in Celsius degrees). This relationship has a constant rate of change when the altitude is between sea level and 11,000 meters.*

Which function can represent the relationship when the altitude is between 0 and 11,000 meters above sea level?

Altitude (meters) — Temperature (°C) :-:—:-:—:-:—
1000 — $8\frac{1}{2}$ 3000 — $-4\frac{1}{2}$ 8000 — -37

*The relationship also has a constant rate of change when the altitude is between 20,000 meters above sea level and 32,000 meters above sea level, but the constant rates are different for each range of altitudes.

Ans $\boxed{\mathrm{T} = 15 - \frac{13}{2000}\mathrm{A}}$

$\mathrm{T} = \frac{2000}{13}\mathrm{A}$
$\mathrm{T} = \frac{13}{2000}\mathrm{A} + 1$
$\mathrm{T} = \frac{2000}{13}\mathrm{A} - 1000$

Hint 1 The first row tells us that at an altitude of 1000 meters, the temperature is $8\frac{1}{2}^\circ$C. The second row tells us that at an altitude of 3000 meters, the temperature is $-4\frac{1}{2}^\circ$C.

$3000 - 1000 = 2000$
$-4\frac{1}{2} - 8\frac{1}{2} = -13$

Therefore, an increase of 2000 meters in altitude *decreases* the temperature by 13°C. Now let's find the change in temperature for an increase of 1 meter in altitude.

Hint 2 $\dfrac{-13}{2000} = -\dfrac{13}{2000}$

So the rate of change is $-\frac{13}{2000}$. Note that what we did was like finding the slope of the line that passes through the points $(1000\ ,\ 8\frac{1}{2})$ and $(3000\ ,\ -4\frac{1}{2})$.

Hint 3 The only function with the above rate of change is: $\mathrm{T} = 15 - \dfrac{13}{2000}\mathrm{A}$ Therefore, this is the correct function.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.2
Version: 3b5319ca.. 2013-10-14

15 xa2a5f315

The table below describes the relationship between A, the altitude above sea level (in meters), and T, the temperature corresponding to that altitude (in Celsius degrees). This relationship has a constant rate of change when the altitude is between 20,000 meters above sea level and 32,000 meters above sea level.*

Which function can represent the relationship when the altitude is between 20,000 and 32,000 meters above sea level?

Altitude (meters) — Temperature (°C) :-:—:-:—:-:—
20,000 — $-56\frac{1}{2}$ 27,000 — $-49\frac{1}{2}$ 32,000 — $-44\frac{1}{2}$

*The relationship also has a constant rate of change when the altitude is between sea level and 11,000 meters above sea level, but the constant rates are different for each range of altitudes

Ans $\boxed{\mathrm{T} = \frac{1}{1000}\mathrm{A} - 76\frac{1}{2}}$

$\mathrm{T} = -\frac{1}{1000}\mathrm{A} - 36\frac{1}{2}$
$\mathrm{T} = 1000\mathrm{A} - 36\frac{1}{2}$
$\mathrm{T} = -\frac{1}{1000}\mathrm{A} - 56\frac{1}{2}$

Hint 1 The first row tells us that at an altitude of 20,000 meters, the temperature is $-56\frac{1}{2}^\circ$C. The second row tells us that at an altitude of 27,000 meters, the temperature is $-49\frac{1}{2}^\circ$C.

$27{,}000 - 20{,}000 = 7000$
$-49\frac{1}{2} - (-56\frac{1}{2}) = -49\frac{1}{2} + 56\frac{1}{2} = 7$

Therefore, an increase of 7000 meters in altitude increases the temperature by 7°C. Now let's find the increase in temperature for an increase of 1 meter in altitude.

Hint 2

$$\frac{7}{7000} = \frac{\cancel{7}}{\cancel{7} \cdot 1000} = \frac{1}{1000}$$

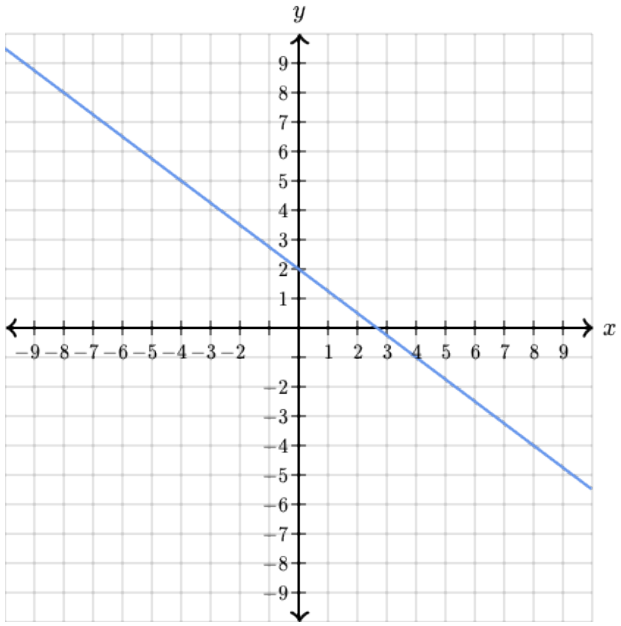
So the rate of change is $\frac{1}{1000}$. Note that what we did was like finding the slope of the line that passes through the points $(20{,}000\ ,\ -56\frac{1}{2})$ and $(27{,}000\ ,\ -49\frac{1}{2})$.

Hint 3 The only function with the above rate of change is: $\mathrm{T} = \dfrac{1}{1000}\mathrm{A} - 76\dfrac{1}{2}$ Therefore, this is the correct function.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.2
Version: 8c3aed41.. 2013-10-14

16 xb4646a5f

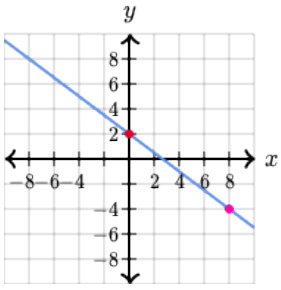
Determine which function corresponds to the following graph by finding the rate of change of the graph.



Ans $\boxed{y = -\frac{3}{4}x + 2}$

$y = -\frac{3}{4}x$
$y = \frac{3}{4}x + 2$
$y = \frac{3}{4}x$

Hint 1 Let's find the rate of change of the graph, which is also what we call the *slope* of the graph. We need the exact coordinates of two points the graph passes through, so let's find two points whose values are integers. There are several points like this. We will use $(0, 2)$ and $(8, -4)$.



Hint 2 The formula of the slope of the graph is **rise over run**, or in other words: (change in y)/(change in x).

$$\begin{aligned}\frac{(-4)-2}{8-0} &= \frac{-6}{8}\\ &= -\frac{6}{8}\\ &= -\frac{\cancel{2}\cdot 3}{\cancel{2}\cdot 4}\\ &= -\frac{3}{4}\end{aligned}$$

Therefore, the rate of change is $-\frac{3}{4}$.

Hint 3 There are *two* functions with this rate of change: $y = -\frac{3}{4}x$ and $y = -\frac{3}{4}x + 2$

How do we decide which is the correct function?

Hint 4 Note that the first function represents a proportional relationship, and therefore its graph passes through the origin, meaning the point $(0, 0)$. Our graph *doesn't* pass through the origin and therefore isn't described by the first function.

Hint 5 The only function that has the correct rate of change and doesn't describe a proportional relationship is: $y = -\frac{3}{4}x + 2$ Therefore, this is the correct function.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.2
Version: 962b8c35.. 2013-10-14

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17 xb48a795b

Dulce the baker likes his bread sweet. For every 10 grams of table salt he uses, he adds 25 grams of sugar.

Assuming the relationship is *proportional*, which function can represent the relationship between the amount of table salt in grams, T, and the amount of sugar in grams, S?

Ans $\boxed{S = \frac{5}{2}T}$

$S = 25 + \frac{5}{2}T$
$S = \frac{10}{25}T$
$S = 10 + \frac{10}{25}T$

Hint 1 We know that for every 10 grams of table salt he uses, Dulce adds 25 grams of sugar. So how many grams of sugar will he add to 1 gram of table salt?

Hint 2

$$\begin{aligned}\frac{25}{10} &= \frac{\cancel{5}\cdot 5}{\cancel{5}\cdot 2}\\ &= \frac{5}{2}\end{aligned}$$

The rate of change is $\frac{5}{2}$.

There are *two* functions with this rate of change: $S = \frac{5}{2}T$ and $S = 25 + \frac{5}{2}T$

How do we decide which is the correct function?

Hint 3 Remember that we are told the relationship is *proportional*. Since the second equation doesn't represent a proportional relationship, we must rule it out.

Hint 4 The only function with the correct rate of change that represents a proportional relationship is: $S = \frac{5}{2}T$ Therefore, this is the correct function.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.2
Version: 571dce2c.. 2013-10-14

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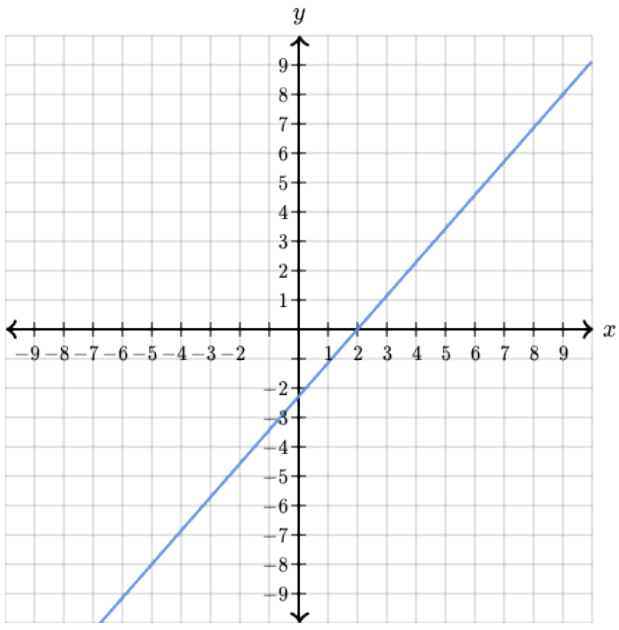
18 xc27f0d7f

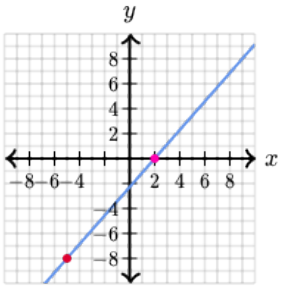
Determine which function corresponds to the following graph by finding the rate of change of the graph.



Ans $\boxed{y = \frac{8}{7}x - 2\frac{2}{7}}$

$y = 2\frac{2}{7} - \frac{8}{7}x$
$y = -2\frac{2}{7} - \frac{7}{8}x$
$y = \frac{7}{8}x - 2\frac{2}{7}$

Hint 1 Let's find the rate of change of the graph, which is also what we call the *slope* of the graph. We need the exact coordinates of two points the graph passes through, so let's find two points whose values are integers. There are several points like this. We will use $(-5,-8)$ and $(2,0)$.



Hint 2 The formula of the slope of the graph is **rise over run**, or in other words: (change in y)/(change in x).

$$\frac{0-(-8)}{2-(-5)}=\frac{8}{7}$$

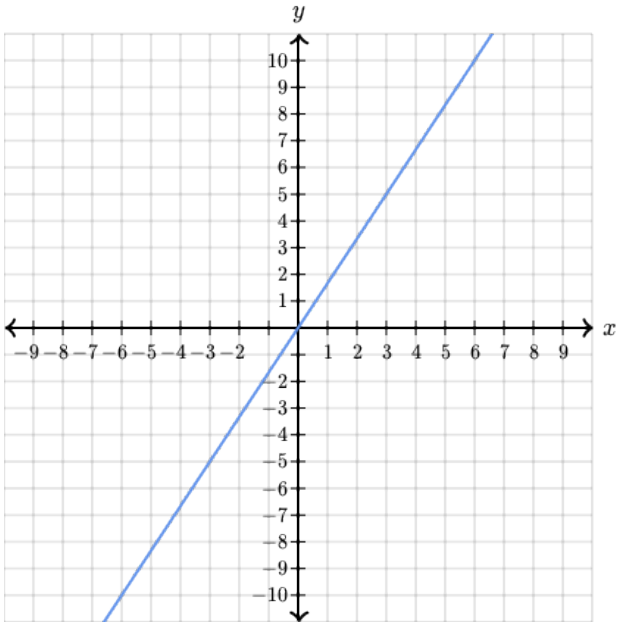
Therefore, the rate of change is $\frac{8}{7}$.

Hint 3 The only function that has the correct rate of change is: $y=\frac{8}{7}x-2\frac{2}{7}$ Therefore, this is the correct function.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.2
Version: 5229143d.. 2013-10-14

19 xe0c136c7

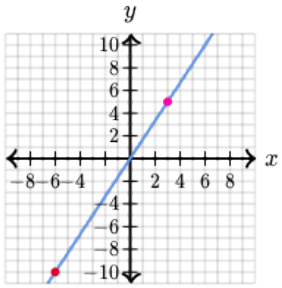
Determine which function corresponds to the following graph by finding the rate of change of the graph.



Ans $\boxed{y=\frac{5}{3}x}$

$y=\frac{5}{3}x+\frac{5}{3}$
$y=\frac{5}{3}x$
$y=\frac{5}{3}x+\frac{3}{5}$

Hint 1 Let's find the rate of change of the graph, which is also what we call the *slope* of the graph. We need the exact coordinates of two points the graph passes through, so let's find two points whose values are integers. There are several points like this. We will use $(-6,-10)$ and $(3,5)$.



Hint 2 The formula of the slope of the graph is **rise over run**, or in other words: (change in y)/(change in x).

$$\begin{aligned}\frac{5-(-10)}{3-(-6)}&=\frac{15}{9}\\&=\frac{\cancel{3}\cdot 5}{\cancel{3}\cdot 3}\\&=\frac{5}{3}\end{aligned}$$

Therefore, the rate of change is $\frac{5}{3}$.

Hint 3 There are *two* functions with this rate of change: $y=\frac{5}{3}x$ and $y=\frac{5}{3}x+\frac{5}{3}$

How do we decide which is the correct function?

Hint 4 Note that the second function doesn't represent a proportional relationship, and therefore its graph doesn't pass through the origin, meaning the point $(0,0)$. Our graph *passes* through the origin and therefore isn't described by the second function.

Hint 5 The only function that has the correct rate of change and describes a proportional relationship is: $y=\frac{5}{3}x$ Therefore, this is the correct function.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.2
Version: 55de4674.. 2013-10-14

20 xf7035987

"Simba" travel agency came out with a special offer for Mountain Kilimanjaro - pay as you climb! The table below describes the relationship between the altitude of the climb and the price to pay to get there.

Assuming the rate of change is constant, which function can represent the price paid for climbing, P, as a function of the altitude in meters, A?

Altitude (meters) — Price ($) :-:—:-:—:-:— 3962 (Shira Volcanic Cone) — 350 5149 (Mawenzi Volcanic Cone)— 528.05 5895 (Kibo Volcanic Cone)— 639.95

Ans $P = \frac{20}{3}A + 350$

$P = 639\frac{96}{100} - \frac{3}{20}A$

$\boxed{P = -244\frac{3}{10} + \frac{3}{20}A}$

$P = -\frac{20}{3}A + 3962$

Hint 1 The second row tells us that to get to an altitude of 5149 meters, the price is $528.05. The third row tells us that to get to an altitude of 5895 meters, the price is $639.95.

$5895 - 5149 = 746$

$639.95 - 528.05 = 111.90$

Therefore, an increase of 746 meters in altitude increases the price by $111.90. Now let's find the increase in price for an increase of 1 meter in altitude.

Hint 2

$$\begin{aligned}\frac{111.90}{746} &= \frac{111.9 \cdot 10}{746 \cdot 10} \\ &= \frac{1119}{7460} \\ &= \frac{\cancel{373} \cdot 3}{\cancel{373} \cdot 20} \\ &= \frac{3}{20}\end{aligned}$$

So the rate of change is $\frac{3}{20}$. Note that what we did was like finding the slope of the line that passes through the points (5149 , 528.05) and (5895 , 639.95).

Hint 3 The only function with the above rate of change is: $P = -244\frac{3}{10} + \frac{3}{20}A$ Therefore, this is the correct function.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.2
Version: d98cf7ad.. 2013-10-14

21 x006df951

Rachel is driving her truck from Boston to Chicago. Rachel drives 15 kilometers every 10 minutes.

Consider the relationship between the time since Rachel started driving and the remaining distance to get to Chicago. We know the relationship has a constant rate of change.

Which statement is correct?

Ans The relationship between time and remaining distance is proportional.

$\boxed{\text{The remaining distance decreases by 45 kilometers every } \frac{1}{2} \text{ hour that passes.}}$

Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "The relationship between time and remaining distance is proportional." Since the relationship is linear, both variables have to be 0 together for it to be proportional. Do they?

Hint 2 No. At the beginning of the ride, when time is 0 minutes, the distance is the *entire* distance from Boston to Chicago which is certainly not 0. The statement is incorrect.

Now let's consider "The remaining distance decreases by 45 kilometers every $\frac{1}{2}$ hour that passes." $\frac{1}{2}$ hour is 30 minutes, so the statement means that Rachel drives 45 km in 30 minutes. Is that true?

Hint 3 We know that Rachel drives 15 km in 10 minutes, so she drives a distance 3 times as that in 30 minutes, meaning 45 km. Therefore, the statement is correct.

Hint 4 The only correct statement is "The remaining distance decreases by 45 kilometers every $\frac{1}{2}$ hour that passes."

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: 26074721.. 2013-10-15

22 x06db4299febe19f4

Isaac is filling up his suitcase with pants and socks. The following equation describes the relationship between the number of pants Isaac is packing, P, and the corresponding number of socks that fits in the suitcase, S.

$S = 28 - \frac{7}{2}P$

Which statement is correct?

Ans $\boxed{\text{When the number of pants decreases, the number of socks i}}$

If Isaac takes 7 pants out of the suitcase, he makes room for 2 more socks.

Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "When the number of pants decreases, the number of socks increases." This is equivalent to saying that the rate of change of the relationship is negative. Is it?

Hint 2 The rate of change is the number multiplied by P in the equation, which is $-\frac{7}{2}$. The number is negative and therefore the statement is correct.

Now let's consider "If Isaac takes 7 pants out of the suitcase, he makes room for 2 more socks." Let's use the rate of change to check the statement.

Hint 3 According to the rate of change, each pair of pants Isaac takes out leaves room for another $\frac{7}{2}$ socks. Therefore, taking out 7 pants would leave room for:

$$7 \cdot \frac{7}{2} = \frac{49}{2} = 24\frac{1}{2}$$

So the statement is incorrect.

Hint 4 The only correct statement is "When the number of pants decreases, the number of socks increases."

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: 0cb728eb.. 2013-10-15

23 x1582a380cef2e837

Entrance to the paintball court with 4 paint balls costs $2.20 and entrance with 20 balls costs $11.

Consider the relationship between the number of paint balls and the price of the ticket. We know the relationship has a constant rate of change.

Which statement is correct?

Ans The slope of the graph of the relationship, where the x-axis represents number of paint balls, is undefined.

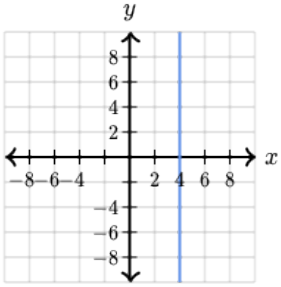
Entrance with 24 balls costs $13.20

Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "The slope of the graph of the relationship, where the x-axis represents number of paint balls, is undefined." The relationship is linear, so its graph is a line. Can it be that the slope of this line is undefined?

Hint 2 An undefined slope means a vertical line, like in this example:



This means that x has only one possible value. But we know that isn't true. So the statement is incorrect.

Now let's consider "Entrance with 24 balls costs $13.20." Let's find the rate of change of the relationship, in order to check the statement.

Hint 3 Entrance with 4 balls costs $2.20. Entrance with 20 balls costs $11.

The rate of change is the value of the ratio between the change in price and the change in number of balls:

$$\begin{aligned}\frac{11-2.20}{20-4} &= \frac{8.80}{16}\\ &= \frac{8.80\cdot 10}{16\cdot 10}\\ &= \frac{88}{160}\\ &= \frac{\cancel{8}\cdot 11}{\cancel{8}\cdot 20}\\ &= \frac{11}{20}\\ &= 0.55\end{aligned}$$

The rate of change is $0.55 per paint ball. To find the price of a ticket with 24 paint balls, we can add the price of 4 balls to the price of a ticket with 20 balls (which is $11). Since each ball costs $0.55, 4 balls cost:

$$0.55\cdot 4 = \$2.20$$

Therefore, a ticket with 24 balls costs $11+2.20 = \$13.20$. The statement is correct.

Hint 4 The only correct statement is "Entrance with 24 balls costs $13.20."

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: 523a4331.. 2013-10-15

24 x170513858836f1aa

Rachel is driving her truck from Boston to Chicago. Rachel drives 15 kilometers every 10 minutes.

Consider the relationship between the time since Rachel started driving and the remaining distance to get to Chicago. We know the relationship has a constant rate of change.

Which statement is correct?

Ans The slope of the graph of the relationship between time and

When time increases by 1 hour, the remaining distance increases by 90 kilometers.

Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "The slope of the graph of the relationship between time and remaining distance is negative." We know the relationship is linear so its corresponding graph is a line.

Suppose the x-axis represents the time that has passed. What happens to y, the remaining distance from Chicago, when x increases?

Hint 2 y *decreases*, since Rachel is always getting *closer* to Chicago. Therefore, the slope is indeed negative, and the statement is correct.

Let's move on to the statement "When time increases by 1 hour, the remaining distance increases by 90 kilometers." Could this be true?

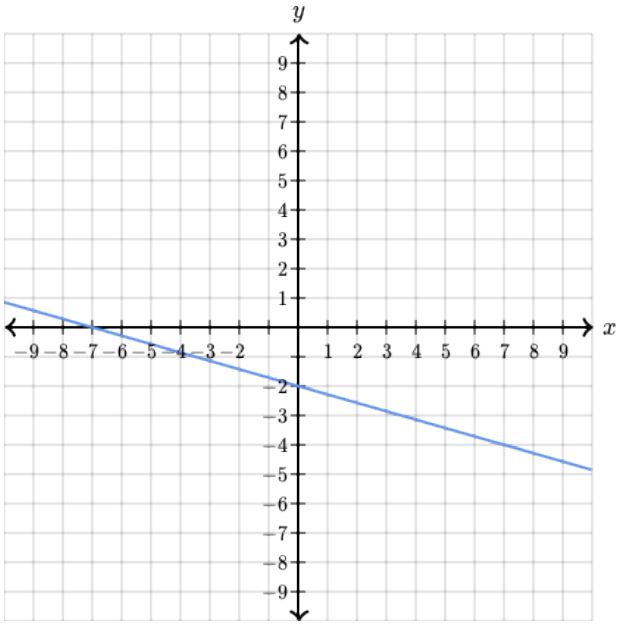
Hint 3 No. We already noted that the distance *decreases* when time increases. So the statement is incorrect.

Hint 4 The only correct statement is "The slope of the graph of the relationship between time and remaining distance is negative."

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: 8a08c939.. 2013-10-15

25 x2360c06637820bdf

Which statement regarding the graph below is correct?



Ans The slope of the graph is negative.

When y increases by 1, x decreases by $3\frac{1}{2}$.

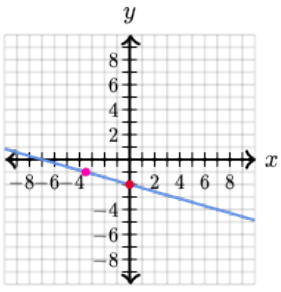
Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "The slope of the graph is negative." We can see that the line is going down to the right, which means the slope is indeed negative (since y *decreases* as x increases). So the statement is correct.

Hint 2 Now let's consider "When y increases by 1, x decreases by $3\frac{1}{2}$." Let's choose a point on the graph, increase y by 1, and see what happens to x. We need the exact values of the point that we choose, so let's take the point $(0, -2)$. If we increase y by 1 from -2 we get to -1. What point on the graph corresponds to this value?

Hint 3 The corresponding point is $(-3\frac{1}{2}, -1)$:



The decrease in x is indeed $3\frac{1}{2}$, so the statement is correct.

Hint 4 Both statements are correct.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: e0597331.. 2013-10-15

26 x25261ad7

Entrance to the paintball court costs \$5 and paint balls are paid for separately. A ticket for entrance with 5 balls, for example, costs \$8.

Consider the relationship between the number of paint balls and the price of the ticket. We know the relationship has a constant rate of change.

Which statement is correct?

Ans The relationship is proportional.

When the number of balls increases by 11, the price increases by

Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "The relationship is proportional." The relationship has a constant rate of change, but for it to be proportional, both variables have to be 0 together. Are they?

Hint 2 We know that entrance without any balls costs \$5. This means that when the number of balls is 0, the price isn't 0. Therefore, the relationship isn't proportional, and the statement is incorrect.

Now let's consider "When the number of balls increases by 11, the price increases by \$6.6." This statement concerns the rate of change of the relationship. Let's find it.

Hint 3 Entrance with 0 balls costs \$5. Entrance with 5 balls costs \$8.

The rate of change is the value of the ratio between the change in price and the change in number of balls:

$$\frac{8-5}{5-0} = \frac{3}{5} = 0.6$$

An addition of 1 paint ball costs \$0.60. Therefore, an addition of 11 balls costs:

$$0.6 \cdot 11 = \$6.6$$

The statement is correct.

Hint 4 The only correct statement is: "When the number of balls increases by 11, the price increases by \$6.6."

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: 0496deaa.. 2013-10-15

27 x385392b78ef3c652

The table below describes the relationship between the number of minutes of mobile phone conversations and their price in some mobile carrier. The relationship has a constant rate of change.

Which statement is correct?

Conversations (minutes) — Price (\$) :-:—:-:—:-:— 50 — 3.50 100 — 5 200 — 8

Ans The graph that describes this relationship passes through the origin, $(0, 0)$.

50 minutes of conversation add \$3.50 to the price.

Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "50 minutes of conversation add \$3.50 to the price." This statement concerns the rate of change of the relationship. Let's find it.

Hint 2 100 minutes of conversation cost \$5. 200 minutes of conversation cost \$8.

The rate of change is the value of the ratio between the change in price and the change in length of conversations:

$$\frac{8-5}{200-100} = \frac{3}{100} = 0.03$$

The rate of change is 0.03, which means each additional minute of conversation costs \$0.03. Therefore, the price of 50 additional minutes is:

$$50 \cdot 0.03 = \$1.50$$

So 50 minutes add \$1.50 and not \$3.50. The statement is incorrect.

Now let's consider "The graph that describes this relationship passes through the origin, $(0, 0)$." This is equivalent to saying that both variables are 0 together. Let's use what we've found so far to check the statement.

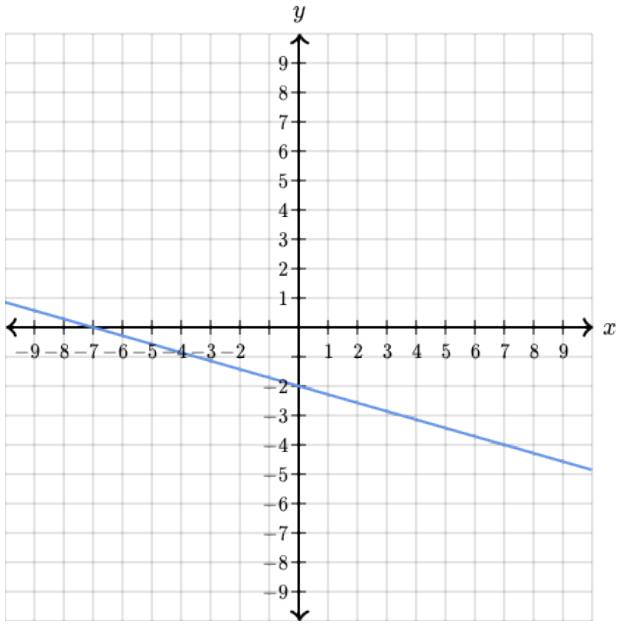
Hint 3 We know that the bill for 50 minutes is \$3.50. We also know that a change of 50 minutes brings a change of \$1.50 to the price. These changes can be negative as well. So if we subtract \$1.50 from \$3.50 we find that 0 minutes cost \$2, and therefore the graph *doesn't* pass through the origin. The statement is incorrect.

Hint 4 None of the statements is correct.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: 67361a6f.. 2013-10-15

28 x39250208

Which statement regarding the graph below is correct?



Ans The relationship between x and y is proportional.

When x decreases by 7, y decreases by 2.

Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "The relationship between x and y is proportional." The graph of a proportional relationship is a line that passes through the origin, which is the point $(0, 0)$. Our graph doesn't pass through the origin, so it doesn't describe a proportional relationship. The statement is incorrect.

Hint 2 Now let's consider "When x decreases by 7, y decreases by 2." This cannot be correct. We can see that the graph is going *down* to the right, which means the slope is *negative*. Therefore, when x decreases, y should *increase*.

Hint 3 None of the statements is correct.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: a468b433.. 2013-10-15

29 x3cd1329e0073114a

The following formula describes the temperature in Fahrenheit degrees, F, as a function of the temperature in Celsius degrees, C:

$$F = \frac{9}{5}C + 32$$

Which statement is correct?

Ans When the temperature increases in Celsius degrees, it also increases in Fahrenheit degrees.

If the temperature increased by 10°C, it means it increased by 18°F.

Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "When the temperature increases in Celsius degrees, it also increases in Fahrenheit degrees." This is equivalent to saying that the rate of change of the relationship is positive. Is it?

Hint 2 The rate of change is the number multiplied by C in the equation, which is $\frac{9}{5}$. The number is positive and therefore the statement is correct.

Now let's consider "If the temperature increased by 10°C, it means it increased by 18°F." Let's use the rate of change to check this statement.

Hint 3 According to the rate of change, each time we increase C by 1, F increases by $\frac{9}{5}$. Therefore, if we increase C by 10, F increases by:

$$10 \cdot \frac{9}{5} = \frac{90}{5} = 18$$

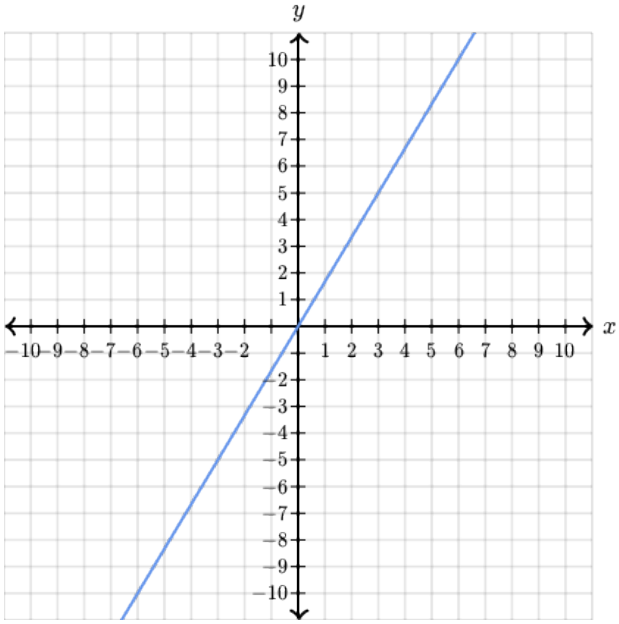
Therefore, the statement is correct.

Hint 4 Both statements are correct.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: cb339c00.. 2013-10-15

30 x4a6cbb8a

Which statement regarding the graph below is correct?



Ans The slope of the graph is negative.

When x decreases by 6, y decreases by 10.

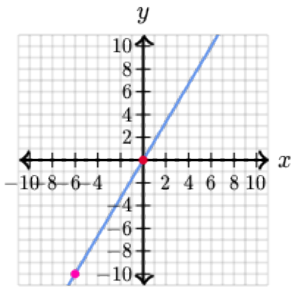
Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "The slope of the graph is negative." We can see that the line is going up to the right, which means the slope is *positive* (since y *increases* when x increases). So the statement is incorrect.

Hint 2 Now let's consider "When x decreases by 6, y decreases by 10." Let's choose a point on the graph, decrease x by 6 and see what happens to y. We need the exact values of the point that we choose, so let's take the point $(0, 0)$. If we decrease x by 6 from 0 we get to -6. What point on the graph corresponds to this value?

Hint 3 The corresponding point is $(-6, -10)$:



The decrease in y is indeed 10, so the statement is correct.

Hint 4 The only correct statement is "When x decreases by 6, y decreases by 10."

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: 5ba28300.. 2013-10-15

31 x52ebdb32

The table below describes the relationship between the number of minutes of mobile phone conversations and their price in some mobile carrier. The relationship has a constant rate of change.

Which statement is correct?

Conversations (minutes) — Price ($) :-:—:-:—:-:— 50 — 3.50 100 — 5 200 — 8

Ans The slope of the graph of the relationship, where the x-axis represents the length of conversations, is less than 1.

$0.75 are worth another 25 minutes of conversation.

Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "$0.75 are worth another 25 minutes of conversation." This statement concerns the rate of change of the relationship. Let's find it.

Hint 2 100 minutes of conversation cost $5. 200 minutes of conversation cost $8.

The rate of change is the value of the ratio between the change in price and the change in length of conversations:

$$\frac{8-5}{200-100} = \frac{3}{100} = 0.03$$

The rate of change is 0.03, which means each additional minute of conversation costs $0.03. Therefore, 25 minutes of conversation are worth:

$$25 \cdot 0.03 = \$0.75$$

The statement is correct.

Hint 3 Now let's consider "The slope of the graph of the relationship, where the x-axis represents the length of conversations, is less than 1." The slope of the graph is equal to the rate of change we've found, which is 0.03. Therefore, the slope is indeed less than 1. The statement is correct.

Hint 4 Both statements are correct.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: ba5011fa.. 2013-10-15

32 x5488daf25ffc29e6

Entrance to the paintball court costs \$5 and paint balls are paid for separately. A ticket for entrance with 5 balls, for example, costs \$8.

Consider the relationship between the number of paint balls and the price of the ticket. We know the relationship has a constant rate of change.

Which statement is correct?

Ans The graph of the relationship, where the x-axis represents the number of paint balls, has a slope of $\frac{5}{3}$.

Entrance with 10 balls costs \$16.

Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "The graph of the relationship, where the x-axis represents the number of paint balls, has a slope of $\frac{5}{3}$." Let's find the slope of this graph.

Hint 2 Entrance with 0 balls costs \$5. Entrance with 5 balls costs \$8.

The slope is the value of the ratio between the change in price and the change in number of balls:

$$\frac{8-5}{5-0} = \frac{3}{5} = 0.6$$

Therefore, the slope of the graph is $\frac{3}{5}$, which means an addition of 1 paint ball costs \$0.60. According to the statement, the slope is $\frac{5}{3}$, so it's incorrect.

Now let's consider "Entrance with 10 balls costs \$16." Let's use what we've found so far to check the statement.

Hint 3 Entrance with 5 paint balls costs \$8, and each addition of a single ball costs \$0.6. If we want to add 5 balls to the ticket, we need to add:

$$0.6 \cdot 5 = \$3$$

Therefore, entrance with 10 paint balls costs \$11 and not \$16. The statement is incorrect.

Hint 4 None of the statements is correct.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: 8d1db1a6.. 2013-10-15

33 x6e8b68cd56f72fb4

The table below describes the relationship between the number of minutes of mobile phone conversations and their price in some mobile carrier. The relationship has a constant rate of change.

Which statement is correct?

Conversations (minutes) — Price (\$) :-:—:-:—:-:— 30 — 1.50 70 — 3.50 100 — 5

Ans The slope of the graph of the relationship, where the x-axis represents the length of conversations , is greater than 1.

25 minutes of conversation add \$1.25 to the price.

Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "25 minutes of conversation add \$1.25 to the price." This statement concerns the rate of change of the relationship. Let's find it.

Hint 2 30 minutes of conversation cost \$1.50. 70 minutes of conversation cost \$3.50.

The rate of change is the value of the ratio between the change in price and the change in length of conversations:

$$\begin{aligned}\frac{3.50-1.50}{70-30} &= \frac{2}{40} \\ &= \frac{\cancel{2}}{\cancel{2}\cdot 20} \\ &= \frac{1}{20} \\ &= 0.05\end{aligned}$$

The rate of change is 0.05, which means each additional minute of conversation costs \$0.05. Now let's find the price of 25 additional minutes.

Hint 3 $25 \cdot 0.05 = \$1.25$

So the statement is correct.

Now let's consider ""The slope of the graph of the relationship, where the x-axis represents the length of conversations , is greater than 1." The slope of the graph is equal to the rate of change we've found, which is 0.05. Therefore, the slope is *less* than 1 and the statement is incorrect.

Hint 4 The only correct statement is "25 minutes of conversation add \$1.25 to the price."

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: 1678ea9e.. 2013-10-15

34 x6eb8a491da6157ec

Dennis is riding his bicycle from his home to his office. Every $\frac{1}{4}$ hour Dennis rides 3 miles.

Consider the relationship between the time since Dennis started riding and the distance he traveled in that time. We know the relationship has a constant rate of change.

Which statement is correct?

Ans Dennis rides $\frac{3}{5}$ miles per minute.

It takes Dennis 3 minutes to ride 1 mile.

Both statements are correct.

None of the statements is correct.

Hint 1 Let's consider each statement separately, starting with "Dennis rides $\frac{3}{5}$ miles per minute." We know that Dennis rides 3 miles in $\frac{1}{4}$ hour, which is 15 minutes. How much does he ride in a single minute?

Hint 2 $$\frac{3}{15} = \frac{\cancel{3}}{\cancel{3} \cdot 5} = \frac{1}{5}$$

So Dennis rides $\frac{1}{5}$ mile and not $\frac{3}{5}$. The statement is incorrect.

Now let's consider "It takes Dennis 3 minutes to ride 1 mile." Again, we know that Dennis rides 3 miles in 15 minutes. How long will it take him to ride a single mile?

Hint 3 $$\frac{15}{3} = 5$$

So it takes Dennis 5 minutes and not 3 to ride a single mile, and the statement is incorrect.

Hint 4 None of the statements is correct.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: d9cb0659.. 2013-10-15

35 x77f0fdd8

Isaac is filling up his suitcase with pants and socks. The following equation describes the relationship between the number of pants Isaac is packing, P, and the corresponding number of socks that fits in the suitcase, S.

$S = 28 - \frac{7}{2}P$

Which statement is correct?

Ans The graph of this equation passes through the origin.

If Isaac wants to add 14 socks, he needs to take out 4 pants.

Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "The graph of this equation passes through the origin." This means that both variables have to be 0 together. Let's substitute 0 for P in the equation.

Hint 2 $$S = 28 - \frac{7}{2} \cdot 0 = 28 - 0 = 28$$

So when Isaac packs 0 pants, he can fit 28 socks. Therefore, the statement is incorrect.

Now let's consider "If Isaac wants to add 14 socks, he needs to take out 4 pants." This statement concerns the rate of change of the relationship, so let's use it.

Hint 3 The rate of change is the number multiplied by P in the equation, which is $-\frac{7}{2}$. This means that each pair of pants Isaac takes *out* leaves room for $\frac{7}{2}$ socks *more*. Therefore, taking out 4 pants would leave room for:

$$4 \cdot \frac{7}{2} = \frac{28}{2} = 14$$

So the statement is correct.

Hint 4 The only correct statement is "If Isaac wants to add 14 socks, he needs to take out 4 pants."

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: 8d98e86b.. 2013-10-15

36 x7df3e4f9

Dennis is riding his bicycle from his home to his office. Every $\frac{1}{4}$ hour Dennis rides 3 miles.

Consider the relationship between the time since Dennis started riding and the distance he traveled in that time. We know the relationship has a constant rate of change.

Which statement is correct?

Ans The relationship between time and distance traveled is proportional.

The slope of the graph of the relationship, where the x-axis represents the time in minutes , is less than 1.

Both statements are correct.

None of the statements is correct.

Hint 1 Let's consider each statement separately, starting with "The relationship between time and distance traveled is proportional." Since the relationship is linear, both variables need to be 0 together for the relationship to be proportional. Do they?

Hint 2 At the beginning of the ride, time is 0 minutes, and the distance traveled is 0 miles. Therefore, the relationship is proportional, and the statement is correct.

Now let's consider "The slope of the graph of the relationship, where the x-axis represents the time in minutes, is less than 1." Since the relationship is linear, its corresponding graph is a line. Let's use the given information to check the statement.

Hint 3 We know that Dennis rides 3 miles in $\frac{1}{4}$ hour, which is 15 minutes.

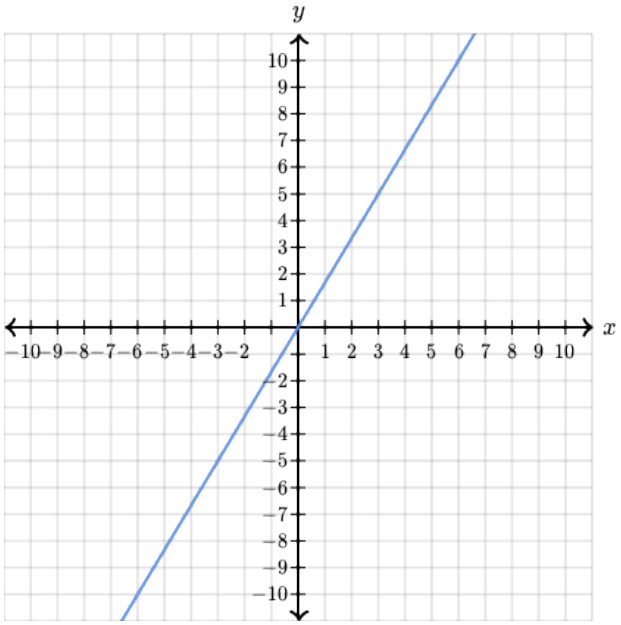
The change in x, time, is greater than the change in y, distance. Since the slope is the constant ratio between any change in y and its corresponding change in x, the slope is indeed less than 1. The statement is correct.

Hint 4 Both statements are correct.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: 74601c2c.. 2013-10-15

37 x819030b668d06769

Which statement regarding the graph below is correct?



Ans The relationship between x and y is proportional.

When y increases by 3, x increases by 5.

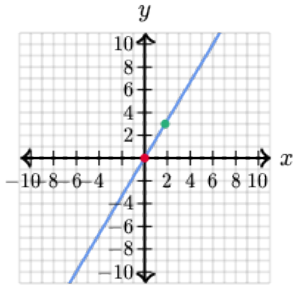
Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "The relationship between x and y is proportional." The graph of a proportional relationship is a line that passes through the origin, which is the point $(0, 0)$. This is indeed the case with this graph, so the statement is correct.

Hint 2 Now let's consider "When y increases by 3, x increases by 5." Let's choose a point on the graph, increase y by 3 and see what happens to x. We need the exact values of the point that we choose, so let's take the point $(0, 0)$. If we increase y by 3 from 0 we get to 3. What point on the graph corresponds to this value?

Hint 3 The corresponding point is $(1.8, 3)$:



x increased only by 1.8, so the statement is incorrect.

Hint 4 The only correct statement is "The relationship between x and y is proportional."

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: ca8fc0a2.. 2013-10-15

38 x8f9d9f60

The following formula describes the temperature in Fahrenheit degrees, F, as a function of the temperature in Celsius degrees, C:

$$F = \frac{9}{5}C + 32$$

Which statement is correct?

Ans When the temperature is 0°C, it is also 0°F.

If the temperature decreased by 9°C, it means it decreased by 5°F.

Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "When the temperature is 0°C, it is also 0°F." Let's substitute 0 for C in the equation.

Hint 2 $F = \frac{9}{5} \cdot 0 + 32 = 32$

This means that when the temperature is 0°C, it is 32°F and not 0°F. The statement is incorrect.

Now let's consider "If the temperature decreased by 9°C, it means it decreased by 5°F." Let's use the rate of change to check this statement.

Hint 3 The rate of change is the number multiplied by C in the equation, which is $\frac{9}{5}$. This means that each time we decrease C by 1, F decreases by $\frac{9}{5}$. Therefore, if we decrease C by 9, F decreases by:

$$9 \cdot \frac{9}{5} = \frac{81}{5} = 16\frac{1}{5}$$

Therefore, the statement is incorrect.

Hint 4 None of the statements is correct.

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: e91c8340.. 2013-10-15

39 x96433542

Entrance to the paintball court with 4 paint balls costs $2.20 and entrance with 20 balls costs $11.

Consider the relationship between the number of paint balls and the price of the ticket. We know the relationship has a constant rate of change.

Which statement is correct?

Ans Entrance without any paint balls is free.

An addition of 12 balls increases the price by $5.50.

Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with "An addition of 12 balls increases the price by $5.50." This statement is about the rate of change of the relationship, so let's find it.

Hint 2 Entrance with 4 balls costs $2.20. Entrance with 20 balls costs $11.

The rate of change is the value of the ratio between the change in price and the change in number of balls:

$$\begin{aligned}\frac{11-2.20}{20-4} &= \frac{8.80}{16}\\ &= \frac{8.80\cdot 10}{16\cdot 10}\\ &= \frac{88}{160}\\ &= \frac{\cancel{8}\cdot 11}{\cancel{8}\cdot 20}\\ &= \frac{11}{20}\\ &= 0.55\end{aligned}$$

Therefore, the rate of change is $0.55 per paint ball. An addition of 12 balls should cost 12 times as that, which is $6.60. So the statement isn't correct.

Now let's consider "Entrance without any paint balls is free." Let's use what we've found so far to check the statement.

Hint 3 We know that entrance with 4 paint balls costs $2.20. We also know that each paint ball costs $0.55, so 4 balls cost:

$0.55 \cdot 4 = \$2.20$

If we subtract the price of 4 balls from the price of a ticket with 4 balls, we get $0. This means that entrance without any paint balls is free. The statement is correct.

Hint 4 The only correct statement is "Entrance without any paint balls is free."

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: 1105532e.. 2013-10-15

40 xb585f6f6

The table below describes the relationship between the number of minutes of mobile phone conversations and their price in some mobile carrier. The relationship has a constant rate of change.

Which statement is correct?

Conversations (minutes) — Price ($) :-:—:-:—:-:— 30 — 1.50 70 — 3.50 100 — 5

Ans

The relationship is proportional.

$40 are worth another 2 minutes of conversation.

Both statements are correct.

None of the statements is correct.

Hint 1 Lets consider each statement separately, starting with ""$40 are worth another 2 minutes of conversation." This statement concerns the rate of change of the relationship. Let's find it.

Hint 2 30 minutes of conversation cost $1.50. 70 minutes of conversation cost $3.50.

The rate of change is the value of the ratio between the change in price and the change in length of conversations:

$$\begin{aligned}\frac{3.50-1.50}{70-30} &= \frac{2}{40}\\ &= \frac{\cancel{2}}{\cancel{2}\cdot 20}\\ &= \frac{1}{20}\\ &= 0.05\end{aligned}$$

The rate of change is 0.05, which means each additional minute of conversation costs $0.05. Therefore, 2 minutes of conversation are worth $0.10, and not $40. The statement is incorrect.

Now let's consider "The relationship is proportional." Since the rate of change is constant, both variables have to be 0 together for the relationship to be proportional. Let's check if they do.

Hint 3 We know that a total of 30 minutes costs $1.50. We also know that each minute costs $0.05. Let's find the change in price for a change of 30 minutes in conversations:

$30 \cdot 0.05 = \$1.50$

if we reduce this sum from the bill for a total amount of 30 minutes, we get $0. Therefore, 0 minutes cost $0 and the relationship is proportional. The statement is correct.

Hint 4 The only correct statement is "The relationship is proportional."

Tags: CC.8.F.B.4, SB.8.1.F.2.CR.1, Slope of a line.3
Version: 0038cec0.. 2013-10-15