Topic: Direct variation

Question: If $3k = 15$ and $kx = 75$, find x.

Answer choices:

A $x = -25$

B $x = 5$

C $x = 15$

D $x = 25$

Solution: C

We'll solve the first equation for k.

$$3k = 15$$

$$\frac{3k}{3} = \frac{15}{3}$$

$$k = 5$$

Now we'll take the value we found for k and plug it into the second equation to solve for x.

$$kx = 75$$

$$5x = 75$$

$$\frac{5x}{5} = \frac{75}{5}$$

$$x = 15$$

Topic: Direct variation

Question: Which equation is not an example of a direct variation?

Answer choices:

A $y = 5x$

B $y = \frac{3}{4}x$

C $5x = 3y$

D $y = 2x + 1$

Solution: D

Remember that the general form of a direct variation equation is $y = kx$.

We can rewrite answer choice C as

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

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

So only answer choice D isn't written in the form $y = kx$. Therefore, answer choice D is not a direction variation equation.

Topic: Direct variation

Question: If we attach weights to a hanging spring, it will stretch. The amount of stretch varies directly with the amount of hanging weight. If a weight of 20 will stretch the spring a distance of 4, what distance will a weight of 50 stretch it? Let w be weight, d be distance, and use the equation $w = kd$.

Answer choices:

A 8

B 10

C 12

D 15

Solution: B

A direct variation equation is in the form $x = ky$. If we let w be weight, and d be distance, we can write

$$w = kd$$

Plugging in the given pair $(d, w) = (4,20)$ gives

$$20 = k \cdot 4$$

$$k = 5$$

Plugging in $w = 50$ and the value of k gives

$$50 = 5d$$

$$d = 10$$