Does each table represent Direct Variation? If yes, state the variation constant.

1.

X	Y	$\frac{y}{x}$
−2.4	−9	3.75
−1.63	−5.1	3.19
5.8	21.75	
12.32	46.2	
32.8	123	

No, it is not Direct Variation because y/x isn't a constant ratio

2.

X	Y	$\frac{y}{x}$
−8.4	68.88	
1.6	−13.12	
6.2	−50.84	
12.5	102.5	
19	−155.8	

No, it is not Direct Variation because the ratio of y/x is negative for only four of the five set of x&y values

3.

X	Y	$\frac{y}{x}$
−4	−12.5	3.125
−1.2	−3.8	3.167
6	19	3.167
15	47.2	3.147
26	81	3.115

Since y/x isn't a constant ratio it doesn't seem like Direct Variation. However, if this data was "real-world" data we may consider this Direct Variation because "real-world" is seldom perfect. Therefore, for real data y/x values that are all very close might indicate this is really Direct Variation. The value of the variation constant would probably be the average of the y/x ratios.

Given the table shows a direct variation relationship, find the value of ?.

To solve Direct Variation situations you can use either equation or you can use a Proportion

X	Y	$\frac{Y}{X}$
4	9	2.25
10	22.5	
24	54	
35	?	

$y = 2.25x$

$? = 2.25(35)$

$? = 78.75$

OR $\frac{9}{4} = \frac{?}{35} \rightarrow ? = 78.75$

1. Use this table to write a Direct Variation equation.

X	Y	$\frac{Y}{X}$
2	12.2	6.1
9	54.9	
15	91.5	
18	109.8	
23	140.3	

$y = 6.1x$

2. Find the value of x when y = 70

Use the Direct Variation Eq. $70 = 6.1x$, $x = 11.48$ or get the same answer with a proportion

3. Find the value of y when x = 51

Use the Direct Variation Eq. $y = 6.1(51)$, $y = 311.1$ or get the same answer with a proportion

A Direct Variation relationship contains the point (-8,11). Write the equation of this Direct Variation.

$k = \frac{y}{x}$

$k = \frac{11}{-8}$

$y = \frac{11}{-8}x$

A Direct Variation relationship has a variation constant of 4.5

Does this direct variation contain the point (6, 27) ?

One way to answer this question is to find the ratio of y/x using this point and see if it matches the variation constant.

$\frac{27}{6} = 4.5$ Therefore, (6,27) must a part of this Direct Variation relationship.

Another way to answer this equation is to write a direct variation equation using the given constant and see if the given point makes the equation true.

$y = 4.5x$

$27 = 4.5(6)$

$27 = 27$

since (6,27) makes the variation equation true it must be a part of this Direct Variation relationship.

Each of the ordered pairs given are for the same direct variation. Find the missing value.

You could use a proprtion

1. (4,18) and (x, 45) $\frac{18}{4} = \frac{45}{x}$ $x = 10$

Or use a Direct Variation Equation

2. (18,6) and (24,y) $k = \frac{y}{x} = \frac{6}{18} = \frac{1}{3}$ $y = \frac{1}{3}x$ $y = \frac{1}{3}(24)$ $y = 8$

Remember the phrase: "Y varies directly with X"

The amount of water in the tub varies directly with the amount of time the water has running. After 5 minutes there are 12 gallons in the tub.

y = gallons of water
x = # of minutes

$k = \frac{Y}{x} = \frac{12g}{5m} = 2.4$ gal/min

1. Model this situation with a Direct Variation equation. $y = 2.4x$

2. Find the amount of time it takes to fill a 32 gallon tub. because 32 is a # of gallons you can use the Direct Variation equation and replace y with 32 then solve for x.

$32 = 2.4x$

$= 13.3 \text{ min} = 13\text{min } 20\text{sec}$

Or you could use a proportion and get the same answer

The number of gallons of paint used varies directly with the number of feet of fencing being painted. 6 gallons of paint was used to paint 111 feet of fencing.

a) State the variation constant, include units. ≈ 0.05 gal/ft $k = \frac{6\text{ gal}}{111\text{ ft}}$

b) Write a direct variation equation. Define your variables.

EQ: $y = 0.05x$

Variables:
x = # feet of fencing
y = # gallons of paint

c) How many gallons of paint will be needed to paint 250 feet of fencing?

Using the equation:
$y = 0.05(250) = 12.5$ gallons

You would probably buy 13 gallons of paint.

Using a proportion: $\frac{6\text{ gal}}{111\text{ ft}} = \frac{y}{250\text{ ft}}$

this leads to an answer of 13.5 which means you would probably buy 14 gallons.

this problem is an example of when rounding in the middle of a problem then using a rounded number to get an answer is dangerous. The proportion is a "better" more accurate answer since the only rounding ocurred with the final answer.

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Problems 23, 24, 26, 28-30, 38, 48, 52, 59 a,b

Due Tomorrow