Direct Variation Homework

1. y varies directly as x. Find the constant of variation and write an equation of direct variation given the following information.

(A) y is 14 when x is 2

$$k = \frac{y}{x} = \frac{14}{2} = 7$$

$$k = 7$$

$$y = 7x$$

(B) y is 5 when x is 8

$$k = \frac{y}{x} = \frac{5}{8}$$

$$k = \frac{5}{8}$$

$$y = \left(\frac{5}{8}\right)x$$

(C) y is 4.5 when x is 15

$$k = \frac{y}{x} = \frac{4.5}{15} = \frac{9}{30} = \frac{3}{10}$$

$$k = \frac{3}{10}$$

$$y = \left(\frac{3}{10}\right)x$$

(D) y is 2 when x is 8

$$K = \frac{y}{x} = \frac{5}{8}$$

$$k = \frac{5}{8}$$

$$y = \left(\frac{5}{8}\right)x$$

2. y varies directly as x. Find the missing value.

(A) y is 14 when x is 2. Find x when y is 21.

$$k = \frac{y}{x} = \frac{14}{2} = 7$$
$$y = 7x$$
$$21 = 7x$$
$$x = 3$$

Or

$$\frac{14}{2} = \frac{21}{x}$$
$$14x = 42$$
$$x = 3$$

(B) y is 5 when x is 8. Find y when x is 28.

$$k = \frac{y}{x} = \frac{5}{8}$$
$$y = \frac{5}{8}x$$
$$y = \frac{5}{8} * 28$$
$$y = 17.5$$

Or

$$\frac{5}{8} = \frac{y}{28}$$
$$8y = 5 * 28$$
$$y = 17.5$$

(C) y is 27 when x is 3. Find x when y is 4.5.

$$k = \frac{y}{x} = \frac{27}{3} = 9$$
$$y = 9x$$
$$4.5 = 9 * x$$
$$x = \frac{1}{2}$$

Or (see right)

$$\frac{27}{3} = \frac{4.5}{x}$$
$$27x = 4.5 * 3$$
$$x = \frac{1}{2}$$

3. Use the given relationships to determine the information about the application.

(A) distance = rate • time.
If a car travels 15 miles per hour, how far has it traveled after 3 hours?

Distance = 15mph * 3hours
Distance = 45 miles

(B) Force = spring constant, k • length
A certain spring (k = 3.5) has a force of 5 N applied to it. How far will it stretch?

5N = 3.5 N/m * Length
Length= 1.4 m