Direct Variation
Worksheet

1. Which equation is *not* an example of a direct variation?

A. $y = \frac{-7}{3}x + 1$ B. $y = \frac{5}{16}x$ C. y = 4x   D. y = -9x

2. Which equation is *not* an example of a direct variation?

A. y = x   B. 2x + 3y = 0   C. $y = \frac{1}{2}x$ D. 5x + 6y = 30

Name the constant of variations(k) for each equation.

3. y = 5x

4. $y = \frac{1}{2}$x

5. $y = \frac{-2}{3}x$

Write a direct variation equation that relates the two variables. Then solve.

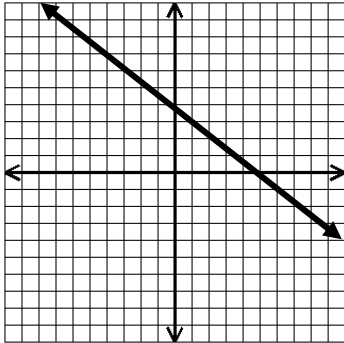6. Suppose y varies directly as x, and y= 16 when x = 8. Find y when x = 16.

7 Suppose y varies directly as x, and y = 21 when x = 3. Find x when y = 42.

8. Suppose v varies directly as g, and v = 36 when g = 4. Find v when g = 11.

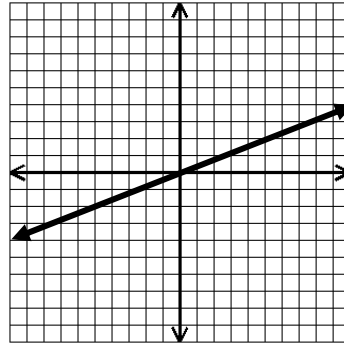9. Suppose a varies directly as b, and a = 7 when b = 2. Find b when a = 21.

10. Suppose y varies directly as x, and y = 9 when x = 3/2. Find y when x = 1.

11. Does the following graph represent a direct variation?

12. Does the following graph represent a direct variation?

Direct Variation Word Problems

Example: A local fast food restaurant takes in $9000 in a 4 hour period. Write a direct variation equation for the relationship between income and number of hours. Estimate how many hours it would take the restaurant to earn $20,250.

a. Write a direct variation equation for the income in any number of hours.

Step 1: Assign variables: Let i = income and h = hours
Step 2: Determine the constant of variation

$$\text{Formula:} \quad \frac{y}{x} = k \quad or \quad \frac{i}{h} = k$$

$$\frac{9000}{4} = k$$

k = 2250   (constant of variation)

Step 3: Write the direct variation equation

Formula: y = kx or i = kh

i = 2250h   (direct variation equation)

b. Estimate how many hours it would take the restaurant to earn $20,250.

i = 2250h   (direct variation equation)

20250 = 2250h   (substitute 20,250 for income and solve)

$$\frac{20250}{2250} = h$$

h = 9   At this rate, it will take 9 hours for the restaurant to earn $20,250

13. Your distance from lightning varies directly with the time it takes you to hear thunder. If you hear thunder 10 seconds after you see the lightning, you are about 2 miles from the lightning.

    a. Write a direct variation equation for the relationship between time and distance.

    b. Estimate how many seconds it would take for the thunder to travel a distance of 4 miles.

14. A recipe for 2 dozen corn muffins calls for 3 cup of flour. The number of muffins varies directly with the amount of flour you use.

    a. Write a direct variation equation for the relationship between the number of cups of flour and the number of muffins.

    b. Estimate how many cups of flour are needed to make 6 dozen muffins.