Variation – Day 1
Notes

Name_____
Date_____Period____

Definition: If y varies directly with x, then as the value of x increases, the value of y also increases.

Equation: $y = kx$, where k is the constant of variation. (k cannot be 0.)

k can be found by the following equation, $k = \frac{y}{x}$.

Example 1

Julio's wages vary directly with the number of hours that he works. If his wages for 5 hours are $29.75, how much will they be for 30 hours? Let x = the number of hours he works, and let y = Julio's pay.

a. Find the value of k. k = _____

b. Write an equation _____

c. Find Julio's pay for 30 hours. Pay _____

- Sometimes it is easier to solve a variation by using a proportion and cross multiplying.

Example 2

If y varies directly with x, and y = 28 when x = 7, find x when y = 52.

x = _____

Practice

1. A standard shower head uses 18 gallons of water in 3 minutes. Complete the table below that shows that gallons used, y, is a function of time in the shower, x.

a.

x (minutes)	3	6	9	12	15	20	25	30
y (gallons)								

b. What is the k? k = _____

c. Write the equation for the function _____

d. If 270 gallons were used, how many minutes were spent in the shower?_____

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For the following word problems, write an equation and answer each question.

2. Cynthia charges $4 an hour to walk a dog. How much would she charge for $2\frac{1}{2}$ hours?

k = _____ Equation _____ Answer _____

3. It takes Maxine $2\frac{1}{2}$ hours to bake a cake. How long would it take her to bake 4 cakes?

k = _____ Equation _____ Answer _____

4. Damian can type 45 words per minute. How many can he type in 3 hours?

k = _____ Equation _____ Answer _____

5. It takes $\frac{2}{3}$ of an hour for Chad to wash and wax a car. How long will it take for 7 cars?

k = _____ Equation _____ Answer _____

Solve using proportions. Assume that y varies directly with x.

6. If y = 27, when x = 6, find x when y = 45. x = _____

7. If y = 2.5, when x = 0.5, find y when x = 20. y = _____

8. If y = 4, when x = 12, find y when $x = -24$. y = _____

9. If y = 80, when x = 32, find x when y = 100. x = _____

10. If $y = -6$, when x = 9, find y when x = 6. y = _____