

## 2-2 Direct Variation Notes

- I. A direct variation is a function in the form  $y = kx$ .
- II. Details from the formula.
  - a. The constant of variation is  $k$ , the coefficient of  $x$ .
  - b.

$y = kx$

$y = mx + b$

$k = m = \text{slope} = \text{rate of change}$

- c. What is the  $y$ -intercept or “ $b$ ” of a direct variation? \_\_\_\_\_; This means all direct variations pass through the \_\_\_\_\_.

- III. Many direct variation word problems are expressed as:

"... $y$  varies directly as  $x$ ..."

$y$  varies or changes because it is the dependent variable.

- IV. Is each equation a direct variation? If it is, find the constant of variation.
  - a.  $8x + 4y = 12$
  - b.  $8x + 4y = 0$

- V. What is the equation of the direct variation passing through:
  - a.  $(6, 2)$
  - b.  $(2, 10)$

VI. Real World Problems with Direct Variations

- a. 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. Write an equation for the relationship between time and distance.
  
  
  
  
  
  
  
  
  
  
- b. The force you must apply to lift an object varies directly with the object's weight. You would need to apply 0.625 lbs of force to a windlass to lift a 28 lb weight. How much force would you need to lift 100 lbs?
  
  
  
  
  
  
  
  
  
  
- c. Your percent grade varies directly with the number of correct answers. You got a grade of 80 when you had 20 correct answers.
  - i. Write an equation for the relationship between percent grade and number of correct answers.
  
  
  
  
  
  
  
  
  
  
  - ii. What would your percent grade be with 24 correct answers?
  
  
  
  
  
  
  
  
  
  
- d. The amount of simple interest earned in a savings account varies directly with the amount of money in the savings account. You have \$1000 in your savings account and earn \$50 in simple interest. How much interest would you earn if you had \$1500 in your savings account?