**More Direct Variation**

*Direct variation* is represented by a linear function that has a *y*-intercept of 0.

Direct variation is represented by a linear graph that goes through the origin.

In words, we say “*y* varies directly with *x*” or “*y* is proportional to *x*”.

The ratio of *y*/*x* is the *constant of variation*, which is the same as the slope.

For example: if *y* is 3 times as big as *x*, then *y*=3*x*. Notice that slope is *y/x* = 3.

Examples of direct variation include: Non-Examples of direct variation include:

1. *y* = 3*x* 1. *y* = 3*x* + 2
2. *y* = -5*x* 2. *y* = -6*x* – 3
3. *y* = ½ *x* 3. *y* = ¼ *x* + 3
4. *y* = *x* 4. *y* = *x* – 3
5. 5*x* + 2*y* = 0
6. Circle the examples that represent direct variation.

a. *y* = *x* b. *y* = 3*x* – 4

c. *y* = *x* + 1 d. *y* = 2*x*

e. f.

 

1. Your distance from a lightning strike varies directly with the time it takes you to hear thunder. If you hear thunder 10 seconds after you see lightning, you are about 2 miles from the lightning.
2. What is the independent variable?
3. What is the dependent variable?
4. What is the constant of variation?
5. Write an equation for distance as a function of time.
6. How many miles away is a lightning bolt if you hear the thunder 5 seconds after you see the lightning?
7. A bicyclist traveled at a constant speed during a timed practice period. Write an equation and find the distance the cyclist traveled in 30 minutes.

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| --- | --- |
| **Elapsed time** (minutes) | **Distance** (miles) |
| 10 | 3 |
| 25 | 7.5 |

1. Gasoline is now $3.80 per gallon. Write an equation to model the total cost to put gasoline in a car based on the number of gallons of gasoline purchased.
2. The amount of blood in a person’s body varies directly with body weight. A person who weighs 160 pounds has about 5 quarts of blood. Write an equation to model this situation.