**Activity 4.1.3 Direct and Inverse Variation**

1. How can you determine if two variables are related directly ?
2. How can you determine if two variables are related by an inverse variation relationship?
3. Find the constant of variation *k* if y varies directly as x, and y = 14 when x = 3. Then write and equation relating x and y.

**Which relationships have variables that are “directly proportional”, “inversely proportional,” or is the relationship a “neither.”**

1. The amount of salary you make to the number of hours worked.
2. The faster your speed the less time the trip takes.
3. The volume of the water in a swimming pool as it is filled at a rate of 150 gallons per minute.
4. The temperature in measured in degrees Celcius and also in degree Fahrenheit.
5. The area of a rectangle remains constant and the relationship between of the width to the length.

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1. Violet purchased a new car, as the car’s age increases, the resale price decreases.

**Identify which graph displays two variables which are “directly proportional”, “inversely proportional”, or “neither.”**

1.  11. 12.

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 13. 14. 15.

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 **Given a table identify which relationship is “directly proportional”, “inversely proportional”, or “neither”:**

|  |  |
| --- | --- |
| x | y |
| 2 | 18 |
| 4 | 9 |
| 8 | 4.5 |
| 9 | 4 |
| 12 | 3 |
| 16 | 2.25 |
| 18 | 2 |

|  |  |
| --- | --- |
| x | y |
| 3 | 18 |
| 4 | 32 |
| 5 | 50 |
| 6 | 72 |
| 7 | 98 |
| 8 | 128 |
| 9 | 0.625 |

|  |  |
| --- | --- |
| x | y |
| 1 | 7 |
| 2 | 13 |
| 3 | 23 |
| 4 | 37 |
| 5 | 55 |
| 6 | 77 |
| 7 | 103 |

 16. 17. 18.

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**Solve the following:**

1. The Law of Lever states that to balance a given person seated on a seesaw, the distance the other person is from the pivot (or fulcrum) is inversely proportional to that other persons’ weight .
2. Write an equation for this situation. Let d = distance and w = weight.
3. If Casandra, who weighs 40 lbs., is sitting 5 feet from the fulcrum how far away from the fulcrum will her friend Carlos, who weighs 100 lbs. need to sit to balance Casandra?
4. The weight of a body above the surface of the Earth varies inversely as the square of its distance from the center of the Earth.
	* + - 1. Write an equation to describe this situation. Define your variables.
5. Assume the Earth’s radius is 4000 miles. If a man weights 165 lbs. at the Earth’s surface, how much would he weigh if he is 12,000 miles above the earth’s surface?
6. The amount of money raised at a basketball game is directly proportional to the number of attendees.  The amount of money raised for 300 attendees was $2100.  How much money will be raised for 750 attendees?
7. The volume of gas in a container varies inversely as the pressure. If the volume is 340 ft3 with pressure of 48 lbs/in2, what pressure has to be applied to have a volume of 376 ft3?
8. Distance in feet it takes a car to stop after the brakes are applied varies directly with the square of the car’s speed. The formula d = $\frac{1}{12}$s2 describes this relation for a certain car.
	* + - 1. If the car is traveling at a rate of 75 mph what is the stopping distance?
				2. The average size car is about 13.5 feet. If you are going 75mph, how many cars away would you have to start breaking if a stopped car is in front of you and you want to avoid an accident?