

Direct and Inverse Variations

- **Direct Variation**, where both variables either increase or decrease together.

Follows a $\frac{y}{x} = \frac{y}{x}$ pattern

- **Inverse or Indirect Variation**, where when one of the variables increases, the other one decreases.

Follows a $x \cdot y = x \cdot y$ pattern

EXAMPLES

- The number of dollars I make and how much I work.
- The length of the side a square varies directly with the perimeter of the square.
- The number of people I invite to my bowling party with the number of games they might get to play
- The temperature in my with the amount of time the air conditioning is running.

- My GPA and the number of hours I watch TV.
- The more soup cans you put in your basket.....the amount you pay.
- The more you spendthe amount of debt you have.
- As your speed goes up....your drive time.
- The fatter you get.....your position from the center of a seesaw.
- The more roommates you put in your apartment..... the amount each pays.
- As the # of pets increase....the vet bills..

Ex1) The number of hours, h , it takes for a block of ice to melt varies inversely as the temperature, t . If it takes 2 hours for a square inch of ice to melt at 65° , how long will it take a square inch of ice to melt at 100° ?

Ex2) In kick boxing, it is found that the force, f , needed to break a board, varies inversely with the length, l , of the board. If it takes 5 lbs of pressure to break a board 2 feet long, how many pounds of pressure will it take to break a board that is 6 feet long?

Ex3) Nate is making chocolate chip pancakes for his friends. He has made 36 pancakes with 432 chocolate chips. If the number of pancakes varies directly with the number of chocolate chips, how many chips for 60 cookies?

Ex4) If y varies directly as x and $y = 10$ and $x = 2.4$ find x when $y = 15$.

Ex5) A refund you get varies directly as the number of cans you recycle. If you get a \$3.75 refund for 75 cans, how much should you get for 500 cans?

Ex6) If John weights 70 llbs and sit 4 feet away from the center of the seesaw and Billy weighs 40 lbs how far away from the center of the seesaw should he sit?

Ex7) If John weighs 120 lbs and Michael weighs 100 pounds are both sitting on a 12 foot long seesaw. How far should each sit from the middle to balance the seesaw?