

# #2 Inverse + Direct Variation

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## Inverse

dependent →  $y = \frac{K}{x}$

OR

$$K = yx$$

K = Constant of (CoP) Proportionality  
"always a number"

## Examples

$$C = \frac{225}{n}$$

Halloween Party

n = # of People  
C = Cost per person  
Independent      Dependent

~~Sentence~~ Cost per person is inversely proportional to the # of people with CoP 225

## Direct

dependent →  $y = kx$  OR

$$k = \frac{y}{x}$$

K = Constant of (CoP) Proportionality  
"always a number"

## Example

$$C = 2\pi r$$

Circumference of a Circle

C = Circumference      r = radius  
Dependent      Independent

~~Sentence~~ Circumference is directly proportional to radius with CoP  $2\pi$ .

## #2 Continued

(Ex)  $y$  varies directly with  $x$ . If  $y = -8$  when  $x = 2$ , Find  $y$  when  $x = -6$

$y = kx$       plug in  $y$  and  $x$

$k = \frac{y}{x}$   
 $\frac{-8}{2} = \frac{k(2)}{2}$

$-4 = k$

Found  $k$  and put  
Back original  
equations

$y = -4x$

$x = -6$

$y = ?$

what is  $y$ ?

$y = -4(-6)$

$y = 24$

(Ex)  $y$  varies inversely with  $x$ . If  $y = 40$  when  $x = 2$ , Find  $x$  when  $y = 25$ .

$y = \frac{k}{x}$        $2(40) = \frac{k}{2}$

$80 = k$

$y = \frac{80}{x}$

$x(25) = \frac{80}{x}$

$x(25) = 80$

$x = \frac{80}{25}$

$= 3.2$

Ex #30 from HW

The time it takes to fly from LA. to N.Y. varies *inversely* as the speed of the plane. If the trip takes 6 hrs at 900 kilometers per hour, how long would it take at 800 km/h?

$$y = \frac{k}{x}$$

$$t = \frac{k}{s}$$

t = time  
s = speed

$$t = 6 \text{ hrs}$$
$$s = 900 \text{ km/h}$$

$$6 = \frac{k}{900}$$

$$5400 = k$$

$$t = \frac{5400}{s}$$

$$t = \frac{5400}{800} = 6.75 \text{ hours}$$