Inverse Variation

11/3/2017

Like direct variation, inverse variation is defined by a constant of variation. An inverse relationship is modeled by:

$$y = \frac{k}{x}$$ ← constant

Inverse variation is determined by using:

$$k = yx$$

Ex. 1 y varies inversely as x with a constant of variation of 6. Write an equation.

$$\boxed{y = \frac{6}{x}}$$

Find y if $x = 4$.

$$y = \frac{6}{4}$$

$$\boxed{y = \frac{3}{2}}$$

Find x if $y = 18$.

$$18 = \frac{6}{x}$$

$$18x = 6$$

$$\boxed{x = \frac{1}{3}}$$

Ex. 2 x and y vary inversely. If $x = 3$ when $y = 21$, find the constant and write the equation.

$K = 21(3)$

$K = 63$ → $\boxed{y = \frac{63}{x}}$

Find x when $y = 7$.

$7 = \frac{63}{x}$

$7x = 63$

$\boxed{x = 9}$

Find y when $x = 10$.

$y = \frac{63}{10}$

$\boxed{y = 6.3}$

Ex. 3 Determine whether each table shows a direct, inverse, or no variation. If so, find the values.

$\frac{y}{x}$	x	y	yx
6.6	2	13.2	26.4
4.95	4	19.8	79.2
		33	
	8		
6.6	10	66	660

neither

$\frac{y}{x}$	x	y	yx
9.6	3	29	87
3.48	5	17.4	87
	6		
0.87	10	8.7	87
		7.25	

inverse, $K = 87$

$y = \frac{87}{6}$ → $\boxed{y = 14.5}$

$7.25 = \frac{87}{x}$ → $\boxed{x = 12}$

$\frac{y}{x}$	x	y	yx
		10.2	
5.1	3	15.3	45.9
	4		
5.1	6	30.6	183.6
5.1	9	45.9	413.1

direct, $K = 5.1$

$10.2 = 5.1x$ → $\boxed{x = 2}$

$y = 5.1(4)$ → $\boxed{y = 20.4}$