

## Inverse, and Direct Variations

**Direct Variation** - "y varies directly as x"

$$y = kx \quad k \text{ is the constant of variation}$$

x	0	1	2	3	4
y	0	3	6	9	12

$$y = 3x$$

**Inverse Variation** - "y varies inversely as x"

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

x	0	1	2	3	4
y	--	3	1.5	1	.75

$$y = \frac{3}{x}$$

Identify if the following show direct or inverse variations.

Then find the constant of variation (k) .

1)  $xy = 9$

2)  $x = \frac{y}{2}$

3)

<b>x</b>	1	2	3	4	5
<b>y</b>	-2	-4	-6	-8	-10

4)

<b>a</b>	<b>b</b>
7	4
6	4.7
5	5.6
4	7
3	9.3

**1. If  $y$  varies directly as  $x$  and  $y = 12$  when  $x = -3$ , find  $y$  when  $x = 16$ .**

**1st - find the constant using  $y = kx$**

**2nd - rewrite the equation using the new  $k$**

**3rd - using the new equation plug in  $x$  to find  $y$ .**

2. The volume  $V$  of a gas varies inversely as its pressure  $P$ . If the volume is  $80 \text{ cm}^3$  when the pressure is  $2000 \text{ mm}$ , find the volume when the pressure is  $320 \text{ mm}$  of mercury.

1st - find the constant using  $V = \frac{k}{P}$

2nd - rewrite the equation using the new  $k$

3rd - using the new equation plug in  $x$  to find  $y$ .