W-A1 Algebra 1 4/6

Direct Variation $y = kx$

k = constant of variation

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

	x	y	$y/x = k$
⇒	-9	3	$3/-9$ $-\frac{1}{3}$
⇒	-3	1	$1/-3 = -\frac{1}{3}$
⇒	6	-2	$-2 \div 2 / 6 \div 2 = -\frac{1}{3}$

If all k values are the same, then it is an example of direct variation

$y = kx$

$y = -\frac{1}{3}x$

input x	output y	$y/x = k$
→ -8	-6	$-6 \div -2 / -8 \div -2$ $\frac{3}{4}$
→ -2	$-\frac{3}{2}$	$-3/2 \div -2$ $\frac{3}{4}$
→ 4	3	$\frac{3}{4}$ $\frac{3}{4}$

$y = kx$

$y = \frac{3}{4}x$

$\frac{-\frac{3}{2}}{-2}$ $-\frac{3}{2} \div \frac{-2}{1}$ Keep, change, flip!

$-\frac{3}{2} * -\frac{1}{2}$

$\frac{3}{4}$

1.)

x	y	$y/x = k$
→ 3	−6	$-6/3 = -2$
→ 5	−10	$-10/5 = -2$
−2	8	$8/-2 = -4$

No! not direct variation

2.)

x	y	$y/x = k$
→ −2	−7	$-7/-2 = 7/2$
→ 4	14	$14/4 = 7/2$
→ 6	21	$21/6 = 7/2$

$y = kx$ $\quad y = \frac{7}{2}x$

Direct Variation

$\{(3,2)$ and $(6,y)$

x y

*2 *2

$x = 6$

$k = \frac{y}{x} = \frac{2}{3}$

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

$y = \frac{2}{3}(6)$

$= \frac{12}{3} = 4$

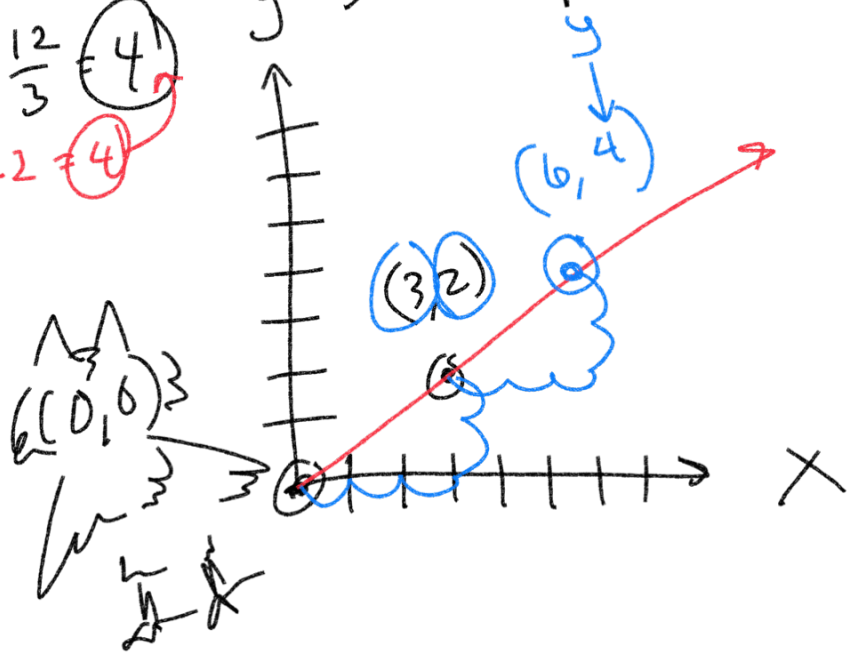
$2 \times 2 = 4$

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

1.) Find k and then $y = kx$

2) "Pattern" way.

3) Graphical



1.) $(9, 15)$ $\div 3$ $(3, y)$ $15 \div 3 = 5$

$x \quad y$

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

$k = \frac{15 \div 3}{9 \div 3} = \frac{5}{3}$

$k = \frac{5}{3}$

$\boxed{y = \frac{5}{3}x}$

$x = 3$

$y = \frac{5}{3}x$

$y = \frac{5}{3}(3)$

$y = 5$

2.) $(-2, 8)$ $(x, 12)$ $y = 12$

$k = \frac{y}{x} = \frac{8}{-2} = -4$

$y = kx$ $\boxed{y = -4x}$

$\frac{12}{-4} = \frac{-4x}{-4}$

$\boxed{x = -3}$

Number Patterns

10, 16, 22, 28, 34

+6 +6 +6 +6

Start # + difference

$10 + 6(n-1)$

$10 + 6(27-1)$

$10 + 6(26)$

$10 + 156 = \boxed{166}$

27th term

n = # of terms

12th term

$10 + 6(12-1)$

$10 + 6(11)$

$10 + 66 = \boxed{76}$

100th term

$10 + 6(100-1)$

$10 + 6(99)$

$10 + 594 = 604$

27, 23, 19, 15, . . .

difference: -4

5th term: 11

10th term: -9

100th term: -369

$27 - 4(100-1)$

$27 - 4(99)$

$27 - 396 = -369$

start difference

$27 \quad -4 \quad (n-1)$

$27 - 4(5-1)$

$27 - 4(4)$

$27 - 16 = \boxed{11}$

$27 - 4(10-1)$

$27 - 4(9)$

$27 - 36 = -9$