

TH-PC Pre-Calculus 12/2

- 1.) Find the slope between the points  $(4, -8)$  and  $(-2, 6)$

$$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - (-8)}{-2 - 4}$$

$$\frac{6+8}{-2-4} = \frac{14}{-6} = \boxed{-\frac{7}{3}}$$

- 2) What is the equation of a line with a slope  $= \frac{4}{3}$  and  $y\text{-int} = -5$

$$\boxed{y = \frac{4}{3}x - 5}$$

- 3.) Find the equation of a line  $m = -\frac{4}{3}$  through  $(6, -9)$

slope-int  
 $y = mx + b$

point-slope  
 $y - y_1 = m(x - x_1)$

$$y - y_1 = m(x - x_1)$$

$$y + 9 = -\frac{4}{3}x + \frac{24}{3}$$

$$y + 9 = -\frac{4}{3}(x - 6)$$

$$y + 9 = -\frac{4}{3}x + 8$$

$$\begin{array}{r} -9 \\ -9 \end{array}$$

$$\boxed{y = -\frac{4}{3}x - 1}$$

4.) Find the equation for the line through  $(4, -2)$  and  $(2, 8)$

$$y = mx + b$$

$$\downarrow \quad \downarrow$$

$$-2 = (-5)(4) + b$$

$$-2 = -20 + b$$

$$+20 \quad +20$$

$$18 = b$$

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - (-2)}{2 - 4} = \frac{10}{2} = 5$$

$$\frac{10}{2} = 5$$

$$y = -5x + 18$$

5.) Find the equation for a line parallel to  $y = -\frac{3}{4}x + 7$  that goes through  $(4, -8)$

$$y = mx + b$$

$$m = -\frac{3}{4}$$

$$\downarrow \quad \downarrow$$

$$-8 = -\frac{3}{4}(4) + b$$

$$-8 = -3 + b$$

$$+3 \quad +3$$

$$-5 = b$$

$$y = -\frac{3}{4}x - 5$$

6.) Find the equation for a line perpendicular to  $4x - 2y = 10$  that goes through  $(-2, 6)$

perpendicular  $\rightarrow$  slopes opposite inverses

given slope = 2  $\rightarrow$   $-2 \rightarrow \frac{-1}{2} = m$

$$y = mx + b \quad y - y_1 = m(x - x_1)$$

$$\downarrow \quad \downarrow$$

$$6 = -\frac{1}{2}(-2) + b$$

$$6 = 1 + b$$

$$-1 \quad -1$$

$$b = 5$$

$$4x - 2y = 10$$

$$-4x \quad -4x$$

$$\frac{-2y}{-2} = \frac{-4x + 10}{-2}$$

$$y = 2x - 5$$

$$y = -\frac{1}{2}x + 5$$

$s$  varies directly with  $t$ .

$$s = kt$$

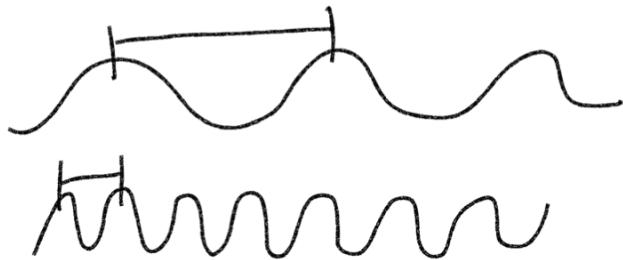
constant of variance

$V$  varies directly with  $x^3$

$$V = kx^3$$

$f$  varies inversely with  $\lambda$

$$f = \frac{k}{\lambda}$$



$F$  varies directly with  $w$  and  $g$  and inversely with  $L$ .

$$F = \frac{kwg}{L}$$

$A$  varies directly with the square of  $r$  equation?

$$A = 9\pi \text{ when } r=3$$

$$A = kr^2$$
$$A = \pi r^2$$

$$A = 9\pi \quad r=3$$

$$k = \frac{9\pi}{9}$$

$$A = kr^2$$

$$9\pi = k(3)^2$$

$$\frac{9\pi}{9} = \frac{9k}{9}$$

1)  $V$  varies directly with the cube of  $r$

$$V = 36\pi \text{ when } r = 3$$

$$V = kr^3$$

$$36\pi = k(3)^3$$

$$k = \frac{36\pi}{27} = \frac{4\pi}{3}$$

$$\begin{matrix} V = 36\pi \\ r=3 \end{matrix}$$

$$\frac{36\pi}{27} = \frac{27k}{27}$$

$$\boxed{V = \frac{4\pi}{3}r^3}$$

2)  $V$  varies directly with both  $h$  and  $r^2$

$$V = l \text{ when } r=2 \text{ and } h = \frac{4}{\pi}$$

$$V = krhr^2$$

$$\frac{\pi}{16}(l) = k \left(\frac{16}{\pi}\right) \left(\frac{\pi}{16}\right)$$

$$l = k \left(\frac{4}{\pi}\right)(2)^2$$

$$k = \frac{\pi}{16}$$

$$l = k \left(\frac{4}{\pi}\right)(4)$$

$$\boxed{V = \frac{\pi hr^2}{16}}$$