20 (a) Slope: $-\frac{4}{3}$ $x_1\ y_1$

Point: $(-5, -3)$ $x_2\ y_2$

(x, y)

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

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

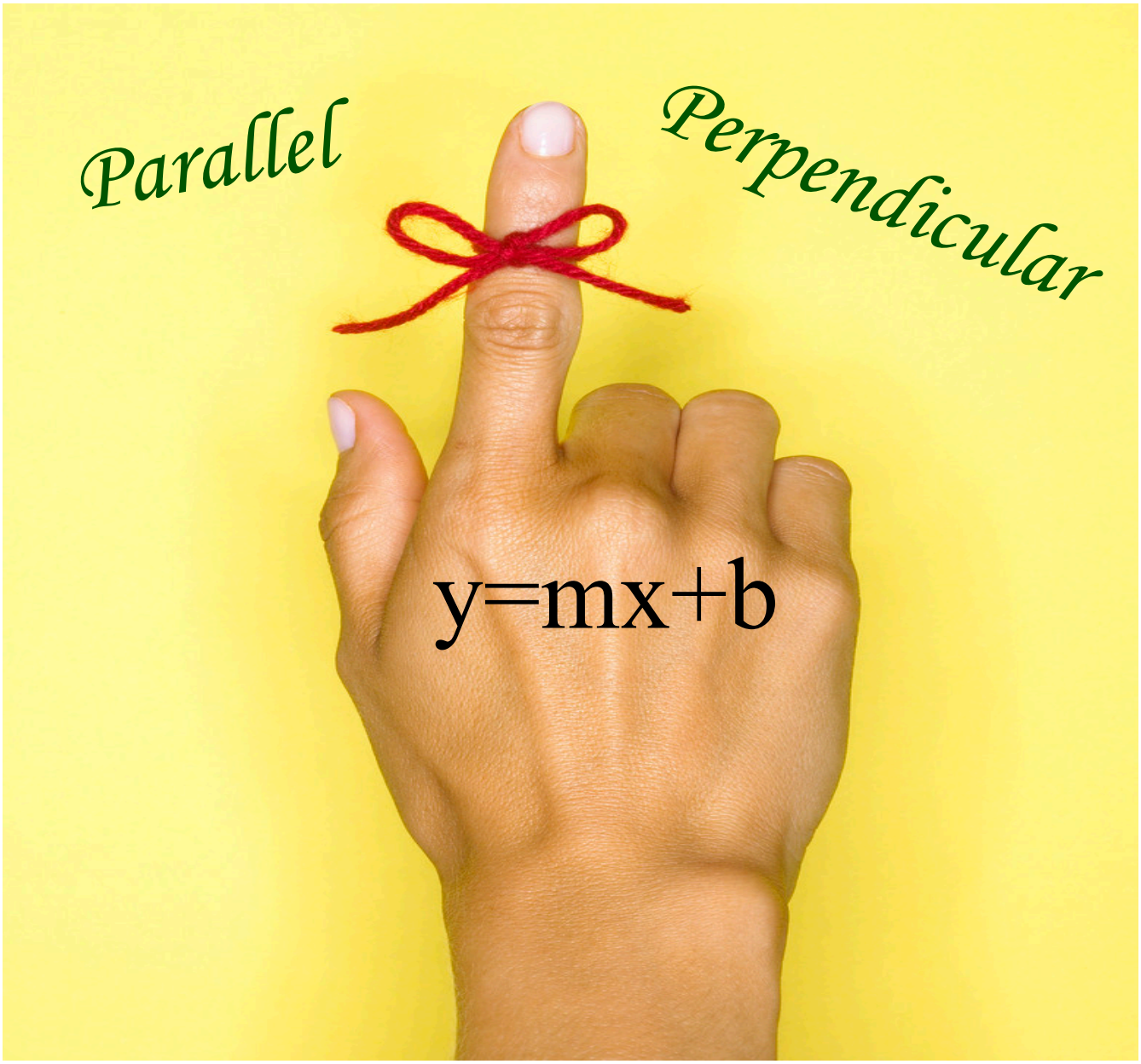
$$-4(x+5) = 3(y+3)$$

$$-4x - 20 = 3y + 9$$

$$-4x - 3y - 20 - 9 = 0$$

$$-4x - 3y - 29 = 0$$

$$+4x + 3y + 29 = 0$$

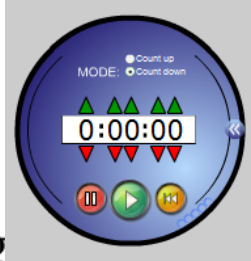

Parallel
Perpendicular
y=mx+b


Reminder !!!
Whenever you see the words Parallel & Perpendicular think
Slope


y-intercept
x=0
Reminder !
x-intercept
y=0

Warm Up Questions

#1 Find the equation of a line parallel to $3y=4x-1$ and passing through the point $(4,2)$.



#2 Determine the equation of a line perpendicular to $4x+5y=7$ and having the same x-intercept as $10x+7y=-20$.

#3 Determine the equation of a horizontal line passing through the same point on the y-axis as $3y = 6x - 9$

Find the equation of a line parallel to 3y=4x-1 and passing through the point (4,2).

Slope: 4/3

Point: (4, 2) (x_1, y_1)

(x y): (x, y) (x_2, y_2)

$\pm Ax + By + C = 0$

Step #1

Parallel - (Same Slope)

$3y = 4x - 1$

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

$m = 4/3$

Step #2

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$\frac{4}{3} = \frac{y - 2}{x - 4}$

$4(x - 4) = 3(y - 2)$

$4x - 16 = 3y - 6$

$4x - 3y - 16 + 6 = 0$

$4x - 3y - 10 = 0$

Determine the equation of a line perpendicular to 4x+5y=7 and having the same x-intercept as 10x+7y=-20.

slope: 5/4

point: (-2, 0) x_1, y_1

(x,y): (x, y) x_2, y_2

Step #1

Opposite Reciprocal Slope

$4x + 5y = 7$

$5y = -4x + 7$

$y = \frac{-4}{5}x + \frac{7}{5}$

$m = 5/4$

Step #2

Point x-int (y = 0)

$10x + 7y = -20$

$10x + 7(0) = -20$

$10x = -20$

$x = -2$

Point (-2, 0)

Step #3

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$\frac{5}{4} = \frac{y - 0}{x + 2}$

$5(x + 2) = 4(y - 0)$

$5x + 10 = 4y$

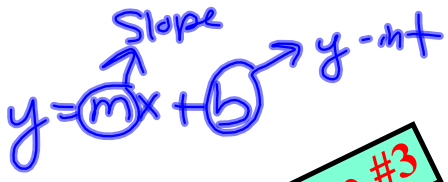
$5x - 4y + 10 = 0$

Determine the equation of a horizontal line passing through the same point on the y-axis as $3y = 6x - 9$

slope: 0/1

point: (0, -3) (x_1, y_1)

(x,y): (x, y) (x_2, y_2)



Step #1

Horizontal Line

Slope = 0/1

Step #2

Point y-int

$\frac{3y}{3} = \frac{6x}{3} - \frac{9}{3}$

$y = 2x - 3$

$b = -3$

OR **(0, -3)**

$3y = 6(0) - 9$

$\frac{3y}{3} = \frac{-9}{3}$

$y = -3$

Step #3

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$\frac{0}{1} = \frac{y + 3}{x - 0}$

$1(y + 3) = 0(x - 0)$

$y + 3 = 0$

M(3, 5) U(-2, -1) D(0, -4)

Find the equation of a line parallel to MD and passing through U.

slope:

point:

(x,y):