

Alg Rev

## Slope of $\perp$ & $\parallel$ Lines & Linear Equations

Ex A are the ~~Points~~ parallel,

lines  $\overleftrightarrow{AB}$  &  $\overleftrightarrow{CD}$   $\parallel$ ,  $\perp$ , neither?

A (-15, 6) B (6, 8) C (4, -2) D (-4, 10)

$$m_{AB} = \frac{8-6}{6-(-15)}$$

$$+ \frac{2}{21}$$

$$m_{CD} = \frac{10-(-2)}{-4-4}$$

$$- \frac{12}{8} = -\frac{3}{2}$$

$\perp$   
Opp Recip.

$\overleftrightarrow{AB}$  (-15, -6) (6, 8)  $m = \frac{8-(-6)}{6-(-15)} = \frac{14}{21} = \frac{2}{3}$

Given E (-3, 0) F = (5, -4) Q = (4, 2)

find P so that  $\overleftrightarrow{PQ} \parallel \overleftrightarrow{EF}$

$$m_{EF} = \frac{-4-0}{5-(-3)} = \frac{-4}{8} = -\frac{1}{2} \text{ parallel lines / same slope}$$

$$m_{PQ} = \frac{y-2}{x-4} = -\frac{1}{2} \quad y-2 = -1 \quad y=1 \quad (6, 1) \quad \text{all points}$$
$$x-4 = 2 \quad x=6$$

$$\text{-or-} \quad \frac{2-y}{4-x} = -\frac{1}{2} \quad 2-y = -1 \quad y=3 \quad (2, 3) \quad \overleftrightarrow{PQ} \nparallel$$
$$4-x = 2 \quad x=2$$

$$\text{-or-} \quad \frac{y-2}{x-4} = \frac{-4}{8} \quad y-2 = -4 \quad y=-2 \quad (12, -2) \parallel \text{ to } \overleftrightarrow{EF}$$
$$x-4 = 8 \quad x=12$$

# Writing Linear Equations

$m \rightarrow$  slope (steepness)

$b \rightarrow$  y-intercept where the line crosses the y-axis where  $x=0$

Equation  $y = mx + b$

Ex 1 y-intercept  $-2$   
slope  $\frac{3}{4}$   $y = \frac{3}{4}x + (-2)$

Ex 2 Equation through  
 $C(4, 6)$   $D(-2, 3)$

① Find  $m$

$$m = \frac{3-6}{-2-4} = \frac{-3}{-6} = \boxed{\frac{1}{2}}$$

② plug in a point

$$y = mx + b$$

③ solve for  $b$

$$y = \frac{1}{2}x + b$$

④ rewrite

$$6 = \frac{1}{2}(4) + b$$

$$6 = 2 + b$$

$$\begin{array}{r} -2 \\ -2 \end{array} \quad \boxed{4 = b}$$

$$\boxed{y = \frac{1}{2}x + 4}$$

$x, y$  or  $4, 6 \leftarrow$

~~169~~  
~~189~~

1-6

289 4-10