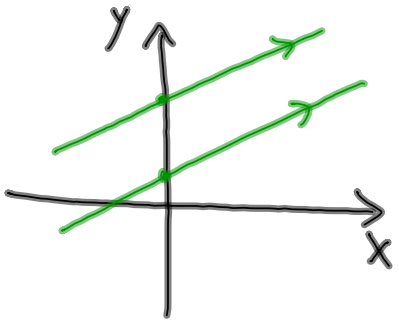
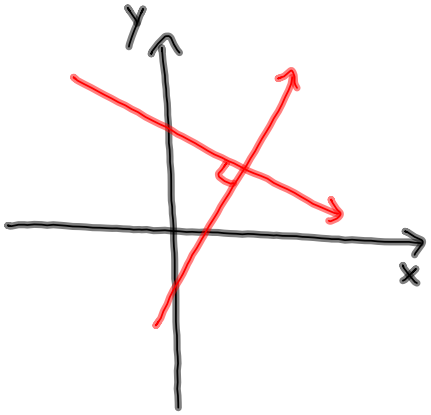
PARALLEL AND PERPENDICULAR LINES.

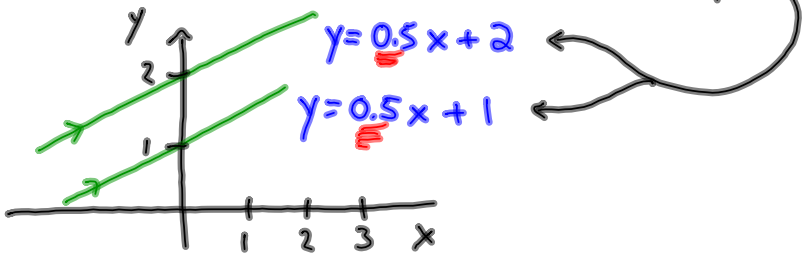
(//) (⊥)





PARALLEL. → SAME SLOPE.

→ DIFFERENT y-intercept. *



* COINCIDENT LINES → 2 LINES THAT ARE EXACTLY THE SAME

→ SAME SLOPE.

→ SAME y-intercept.

Ex: Line goes through $P(15,20)$ and parallel to $y = \frac{4}{5}x - 5$.

① // means same slope: new slope = $\frac{4}{5}$ or 0.8

② $y = a \cdot x + b$

$y = \frac{4}{5}x + b$ ← plug in slope.

$20 = \frac{4}{5}(15) + b$ ← plug in coordinates

$20 = 12 + b$ ← solve for y.

$-12 \quad -12$

$8 = b$

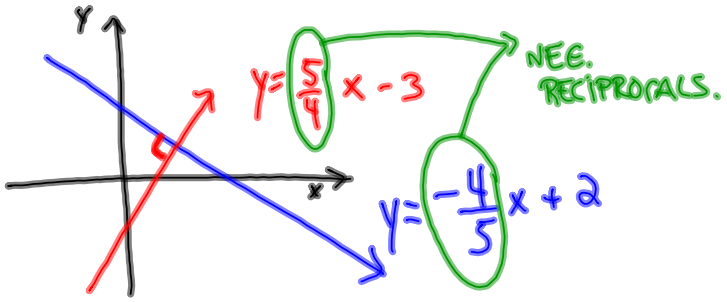
③ $y = \frac{4}{5}x + 8$

Perpendicular ($\perp$) lines.

Slopes are negative reciprocals.

Slope = $\frac{a}{b} \rightarrow \frac{-b}{a}$

Switch the numerator & denominator, & change the sign of the denominator.



Ex: Line goes through $P(20, 28)$ and is perpendicular to $y = -\frac{5}{4}x - 10$.

① Perpendicular $\Rightarrow$ neg. reciprocal slopes. $\left(\frac{a}{b} \to \frac{-b}{a}\right)$

$$-\frac{5}{4} \to \frac{-4}{-5} = \frac{4}{5}$$

② $y = a \cdot x + b$

$y = \frac{4}{5}x + b$

$28 = \frac{4}{5} \cdot 20 + b$

$28 = 16 + b$

$-16 \quad -16$

$12 = b$

$y = \frac{4}{5}x + 12$