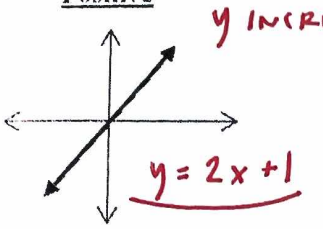
AA PREP: LINEAR RELATIONSHIPS—GRAPHING LINES LECTURE

Slope: $\frac{rise}{run} = \frac{vertical\ change}{horizontal\ change} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{y_1 - y_2}{x_1 - x_2}$

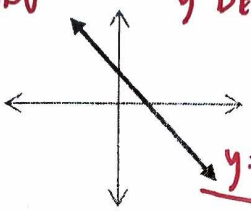
Visual Representations of Slope:

Positive — y INCREASING



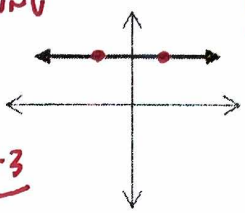
$y = 2x + 1$

Negative — y DECREASING



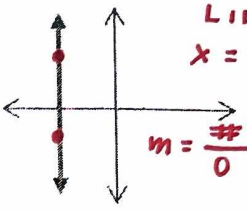
$y = -\frac{1}{2}x + 3$

Zero — HORIZ LINE $y = \#$



$m = \frac{0}{\#} = 0$

Undefined — VERT LINE $x = \#$

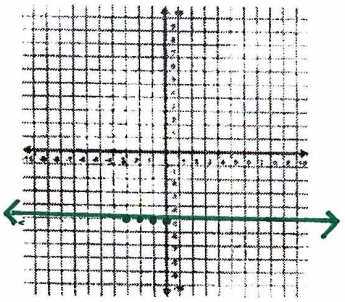


$m = \frac{\#}{0} =$ UND.

Horizontal Lines: $y = \#$

EX 1: $y = -5$

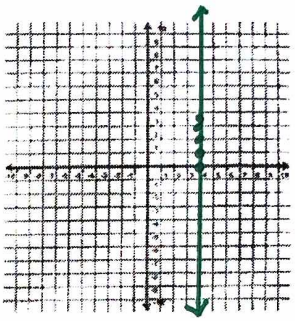
SLOPE: 0



Vertical Lines: $x = \#$

EX 2: $x = 4$

SLOPE: UND.



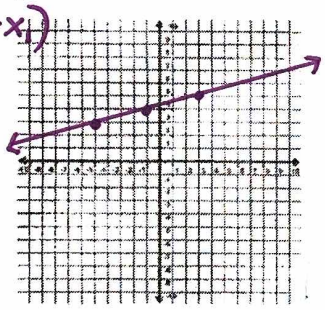
Point-Slope Form: $y - y_1 = m(x - x_1)$

EX 3: $y - 3 = \frac{1}{4}(x + 5)$

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

POINT $(-5, 3)$

SLOPE: $\frac{1}{4}$



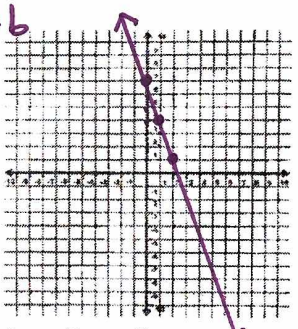
Slope-Intercept Form: $y = mx + b$

EX 4: $y = -3x + 7$

$y = mx + b$

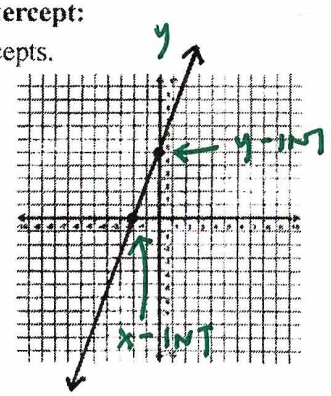
Y-INT $(0, 7)$

SLOPE: $-3 \leftarrow \frac{-3}{1}$



X-Intercept and Y-Intercept:

EX 5: State the intercepts.



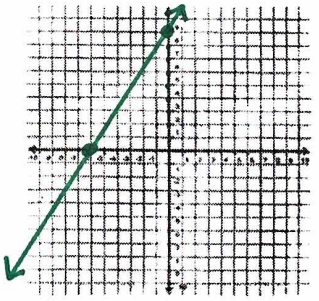
x-INT: $y = 0$ $(-2, 0)$

y-INT: $x = 0$ $(0, 5)$

Standard Form: $Ax + By = C$

NO FRACTIONS!

EX 6: $3x - 2y = -18$



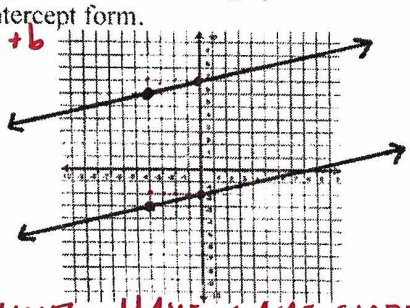
x-INT: $y = 0$ $(-6, 0)$

y-INT: $x = 0$ $(0, 9)$

Parallel Lines:

EX 7: Write the equation of two lines graphed in slope-intercept form.

$y = mx + b$



$y = \frac{1}{4}x + 7$

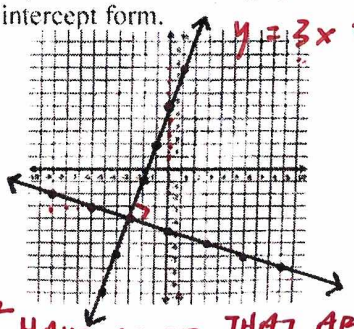
$y = \frac{1}{4}x - 2$

PARALLEL LINES HAVE SAME SLOPE

$\parallel$

Perpendicular Lines:

EX 8: Write the equation of two lines graphed in slope-intercept form.



$y = \frac{3}{2}x + 5$

$y = \frac{-1}{3}x - 5$

PERPENDICULAR LINES HAVE SLOPES THAT ARE OPPOSITE RECIPROCALS