

Objectives: Write the equation of a line given the slope and a point, or if it is parallel/perpendicular to another line.

FORMS OF LINES:

<p>Point-Slope</p> $y - y_1 = m(x - x_1)$	<p>Slope-Intercept</p> $y = mx + b$ <p style="text-align: right;"><i>y int.</i> →</p>
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Writing an Equation in Slope-Intercept: 1) Find slope 2) put into point-slope 3) solve for y

EX 1: passes y-axis at -2,
slope = 2/3

$b = -2$
 $m = 2/3$

Slope-Int.: $y = 2/3x - 2$

EX 2: through (5, -2), slope = -3/5

Pt.-Slope: $y + 2 = -3/5(x - 5)$

$$\begin{array}{r} y + 2 = -3/5x + 3 \\ -2 \qquad \qquad -2 \\ \hline y = -3/5x + 1 \end{array}$$

Slope-Int.: $y = -3/5x + 1$

EX 3: through (-2, 7) and (3, -3)

$$m = \frac{-3 - 7}{3 - (-2)} = \frac{-10}{5} = -2$$

Pt.-Slope: $y - 7 = -2(x + 2)$

$$\begin{array}{r} y - 7 = -2x - 4 \\ +7 \qquad \qquad +7 \\ \hline y = -2x + 3 \end{array}$$

Slope-Int.: $y = -2x + 3$

Parallel Lines have the same slope.
They are co planar and do not intersect.

Perpendicular Lines have slopes that are opposite reciprocals.
They are perpendicular and intersect at 90°.

EX 4: through (3, -2), parallel to $y = -5x + 1$

Pt.-Slope: $y + 2 = -5(x - 3)$

$$\begin{array}{r} y + 2 = -5x + 15 \\ -2 \qquad \qquad -2 \\ \hline y = -5x + 13 \end{array}$$

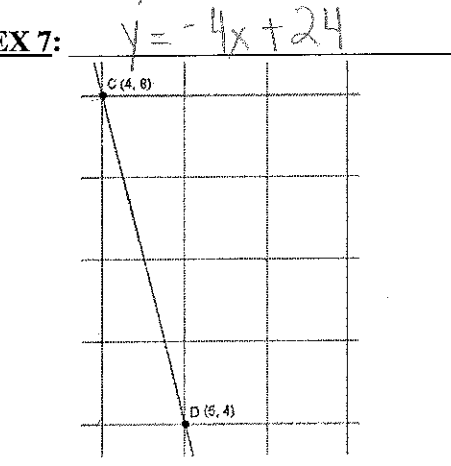
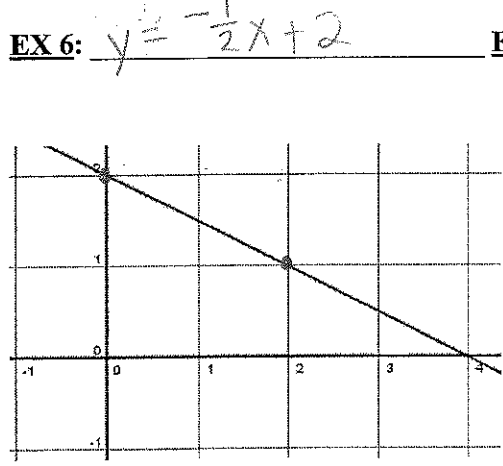
Slope-Int.: $y = -5x + 13$

EX 5: through (5, -6), perpendicular to $y = -3/2x + 7$

$$\begin{array}{r} y + 6 = 2/3(x - 5) \\ y + 6 = 2/3x - 10/3 \\ -6 \qquad \qquad -6 \\ \hline y = 2/3x - 9.3 \end{array}$$

Slope-Int.: $y = 2/3x - 9.3$

6, 7: Write the equation of the line in the graph. $y - 4 = -4(x - 5)$



The line below goes through (-4, 3).

