C4 - Parallel & Perpendicular Lines

Slopes of Parallel & Perpendicular Lines Investigation

For each given line, state the slope of a line that is parallel and the slope of a line that is perpendicular.

$y = mx + b$

a) $y = 4x - 3$

$m_{//} = 4$

$m_\perp = -\frac{1}{4}$

b) $3x + 6y - 7 = 0$

$6y = \frac{-3x}{6} + \frac{7}{6}$

$y = -\frac{1}{2}x + \frac{7}{6}$

$y = mx + b$

$m_{//} = -\frac{1}{2}$

$m_\perp = 2$

Determine Equation (Board Work)

Write the equation of the line perpendicular to 3x - 2y - 12 = 0 and having the same x-intercept as x - y + 4 = 0.

Find slope of line

$3x - 2y - 12 = 0$

$-2y = -3x + 12$

$y = \frac{3}{2}x - 6$

$m = \frac{3}{2}$

$\boxed{m_\perp = -\frac{2}{3}}$

Find point (x-int)

$x - y + 4 = 0$

$x + 4 = 0$ $(y=0)$

$x = -4$

$\boxed{P(-4, 0)}$

Use m and Pt to find eq'n.

$y = mx + b$

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

$0 = -\frac{2}{3}(-4) + b$

$0 = \frac{8}{3} + b$

$-\frac{8}{3} = b$

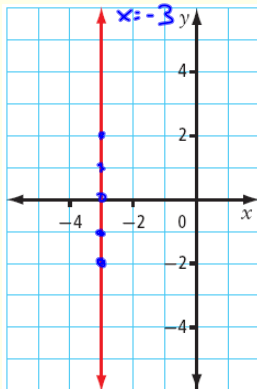$\boxed{y = -\frac{2}{3}x - \frac{8}{3}}$

or

$3y = -2x - 8$

$\boxed{2x + 3y + 8 = 0}$

Practice: pg. 156-157: 2, 6-10, 12

Horizontal and Vertical Lines

For each graph, complete the table of values and state the Domain and Range.
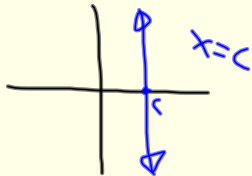
Vertical Lines

$x = -3$

X	Y
-3	-2
-3	-1
-3	0
-3	1
-3	2
-3	50
⋮	⋮

$D: \{x \mid x = -3\}$
$R: \{y \mid y \in R\}$

Equation: $x = -3$

In General:

$x = c$

Vertical Line
↓
$x = \#$

Horizontal Lines

$y = 2$
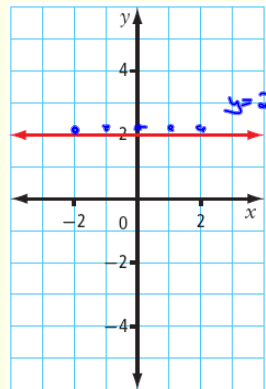
X	Y
-2	2
-1	2
0	2
1	2
2	2
100	2

$D: \{x \mid x \in R\}$
$R: \{y \mid y = 2\}$

Equation: $y = 2$
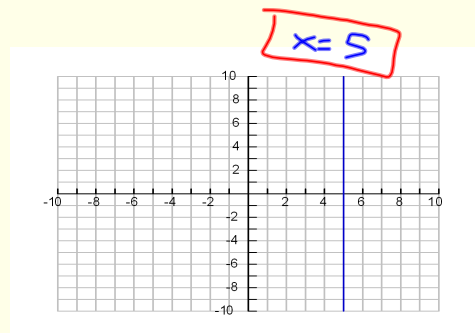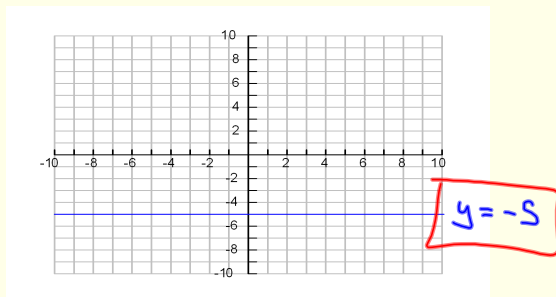
In General:

$y = c$
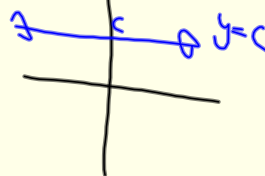
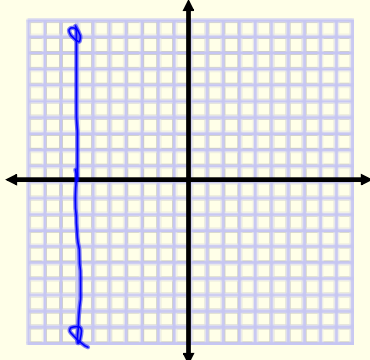Horizontal Line
↓
$y = \#$

Practice: Horizontal & Vertical Lines

Determine the equation of each line:

$y = -5$

$x = 5$

Graph each line.

$x + 7 = 0 \rightarrow x = -7$

$y - 2 = 0 \rightarrow y = 2$