The slopes of PARALLEL lines are EQUAL to each other

\[ y = mx + b \]
The slopes of PERPENDICULAR lines are the NEGATIVE RECIPROCAL of each other

\[ m_1 = \frac{2}{3} \quad \Rightarrow \quad m_2 = -\frac{3}{2} \]

\[ m_1 = -\frac{6}{5} \quad \Rightarrow \quad m_2 = \frac{5}{6} \]

\[ m_1 = -4 \quad \Rightarrow \quad m_2 = \frac{1}{4} \] (\( -\frac{4}{1} \))
Find the equation of a line that is parallel to the line $y = 4x + 1$ that also passes through the point $(-1,1)$.

$$\begin{align*}
y &= mx + b \\
1 &= 4(-1) + b \\
1 &= -4 + b \\
1 + 4 &= b \\
5 &= b
\end{align*}$$

So, the equation of the line is $y = 4x + 5$.

Find the equation of a line that is parallel to the line $y = -2x + 3$ that also passes through the point $(1,-3)$.

$$\begin{align*}
y &= mx + b \\
-3 &= -2(1) + b \\
-3 &= -2 + b \\
-3 + 2 &= b \\
-1 &= b
\end{align*}$$

So, the equation of the line is $y = -2x - 1$. 
Find the equation of a line that is perpendicular to the line $y = -3x + 2$ that also goes through the point $(3,4)$.

$y = mx + b$

$4 = \frac{1}{3} (3) + b$

$4 = 1 + b$

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

$4 - 1 = b$

$3 = b$
Draw a line perpendicular to the x-axis that goes through the point (6,2)

x-axis is Horizontal
Perpendicular to horizontal \Rightarrow \text{vertical}!

Eqn would be $x = 6$
Draw a line parallel to the x-axis that goes through the point (3,-4)

- x-axis is horizontal
- Parallel to x-axis is also horizontal
- Eqn would be $y = -4$
Draw the graph of the line $2x + 3y + 6 = 0$

Find the x and y intercepts

y-int when $x = 0$
$2(0) + 3y + 6 = 0$
$3y + 6 = 0$
$3y = -6$
$\frac{3y}{3} = \frac{-6}{3} \Rightarrow y = -2$

x-int when $y = 0$
$2x + 3(0) + 6 = 0$
$2x + 6 = 0$
$2x = -6$
$\frac{2x}{2} = \frac{-6}{2} \Rightarrow x = -3$