

Perpendicular and Parallel Lines

Two lines are parallel if they have the same slope.

$f(x) = m_1x + b_1$; $g(x) = m_2x + b_2$

The lines for f and g are parallel if $m_1 = m_2$.

If we also have $b_1 = b_2$, f and g coincide.

* The lines for f and g are perpendicular if

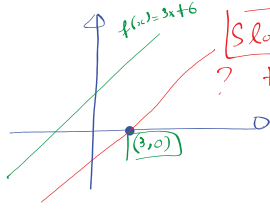
$$m_1 \cdot m_2 = -1 \quad ; \quad m_2 = -\frac{1}{m_1}$$

E.g. $f(x) = 2x + 3$; $g(x) = -\frac{1}{2}x + 10$

$f(x) = \frac{5}{3}x + 11$; $g(x) = -\frac{3}{5}x + 20$

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E.g. Find the equation of the line parallel to the graph of $f(x) = 3x + 6$ and passes through $(3, 0)$



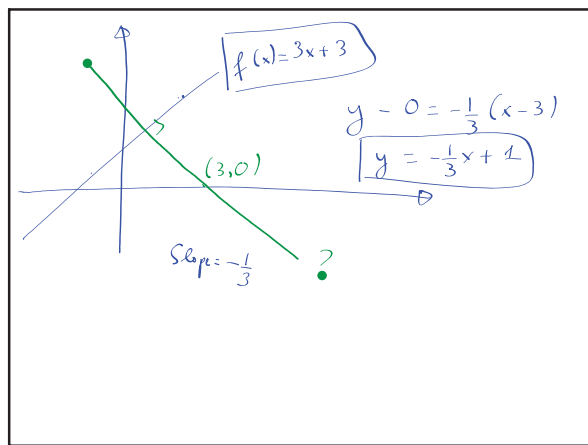
Slope = 3 because it is parallel
? to $f(x) = 3x + 6$.

Point-Slope equation:

$$y - 0 = 3(x - 3)$$

$$y = 3x - 9$$

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