

parallel and perpendicular lines

↪ parallel lines same slope $m_1 = 2$
 $m_2 = 2$

⊥ perpendicular lines opposite reciprocal slopes
 $m_1 = -\frac{1}{3}$ $m_2 = 3$
check: $m_1 m_2 = -1$

Example 1

Determine whether the following lines are parallel, perpendicular, or neither.

a) $y = 2x + 3$ $m_1 = 2$
 $y = -2x + 7$ $m_2 = -2$ neither

b) $5x + 2y = 4$ $5x + 2y = 4$ $-2x + 5y = 3$
 $-2x + 5y = 3$ $2y = -5x + 4$ $5y = 2x + 3$
 $y = -\frac{5}{2}x + 2$ $y = \frac{2}{5}x + \frac{3}{5}$
 $m_1 \& m_2$ are opposite reciprocals $m_1 = -\frac{5}{2}$ $m_2 = \frac{2}{5}$ ⊥

c) $L_1: (-3, -3) (1, 7)$
 $L_2: (0, 4) (5, -2)$
 $m_1 = \frac{7 - (-3)}{1 - (-3)} = \frac{10}{4} = \frac{5}{2}$ so neither
 $m_2 = \frac{-2 - 4}{5 - 0} = -\frac{6}{5}$