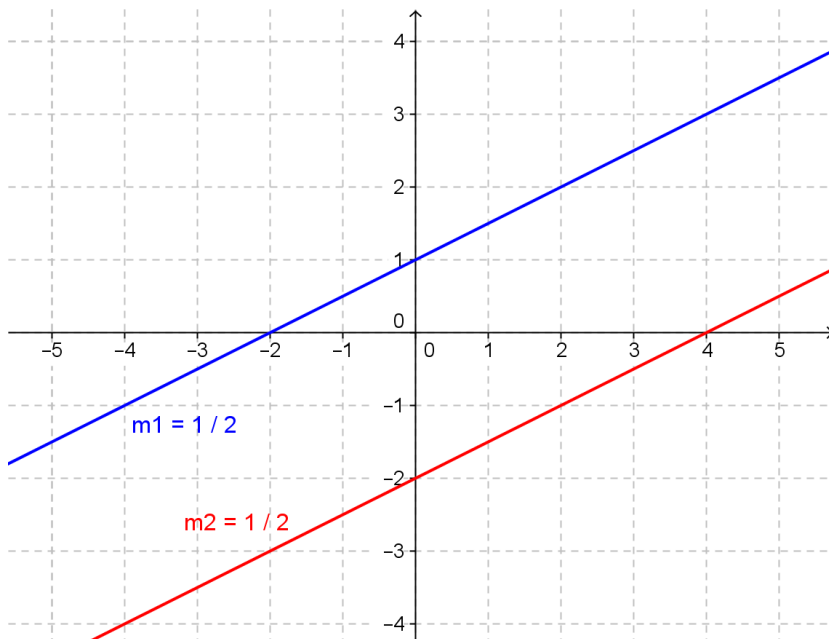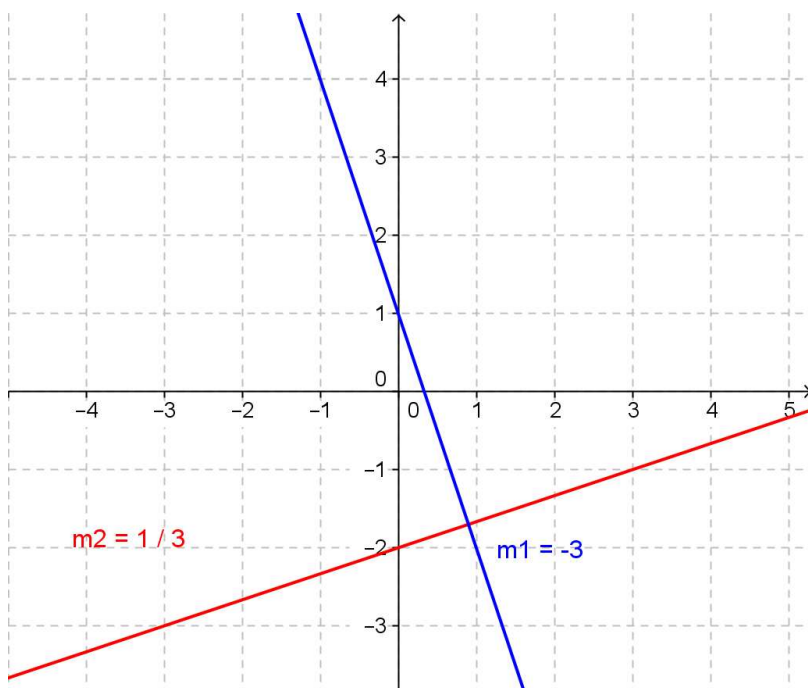## Section 2.5: Parallel and Perpendicular Lines

Two lines with slopes m_1 and m_2 are **parallel** if and only if $m_1 = m_2$

Two lines with slopes m_1 and m_2 are **perpendicular** if and only if $m_1 * m_2 = -1$

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Example 1:

If you have a line with slope -2;

     Any line that is parallel to this line has slope: _____.

     Any line that is perpendicular to this line has slope: _____.

If you have a line with slope 7;

     Any line that is parallel to this line has slope: _____.

     Any line that is perpendicular to this line has slope: _____.

If you have a line with slope 4/9;

     Any line that is parallel to this line has slope: _____.

     Any line that is perpendicular to this line has slope: _____.

Example 2: State whether the following lines are parallel, perpendicular, neither or the same.

$y = -5x + 4$
$y = -5x - 9$

Example 3: State whether the following lines are parallel, perpendicular, neither or the same.

$y = 4x + 4$
$y + \dfrac{1}{4}x = 2$

Example 4: State whether the following lines are parallel, perpendicular, neither or the same.

$3x + 2y = 6$
$-6x - 4y = -12$

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Example 5: State whether the following lines are parallel, perpendicular, neither or the same.

$10y - 5x = 15$
$5x + 10y = -9$

Example 6: Write the equation of a line in slope-intercept form that passes through the point (0, -2) and is parallel to the line $y = -3x + 2$.

Example 7: Write the equation of a line in slope-intercept form that passes through (2, -6) and is perpendicular to the line $y - 4x = -2$.

Example 8: Find the equation of the line that passes through the point $(1/2, -3)$ and is perpendicular to the line $x = 4$.

Example 9: 9. Write the equation in standard form for the line that passes through the point (2, 2) and is parallel to the graph of the line $4x - 5y = -12$.

Example 10: Write the equation of a line in slope-intercept form that passes through (1,2) and is parallel to the line that passes through the points (4, 6) and (6, 10).