Parallel and Perpendicular Lines

If two lines are parallel, then their slopes are equal.

If two lines are perpendicular, then their slopes are opposite reciprocals of each other.

How to create an opposite (negative) reciprocal

| | opposite | | | opposite |
| reciprocal | reciprocal | | reciprocal | reciprocal |

$\dfrac{2}{3}$

-4

$\dfrac{1}{2}$

$-\dfrac{1}{5}$

If two lines are parallel, then their slopes are equal.

If two lines are perpendicular, then their slopes are opposite reciprocals of each other.

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

slope-intercept form

$y = 2x + 7$ $y = 2x - 3$

slope-intercept form

$y = 3x + 7$ $y = -\dfrac{1}{3}x - 3$

Determine if the following lines are parallel or perpendicular.

Put equations in slope-intercept form

$$6x + 3y = 9 \qquad\qquad 2x + y = 1$$

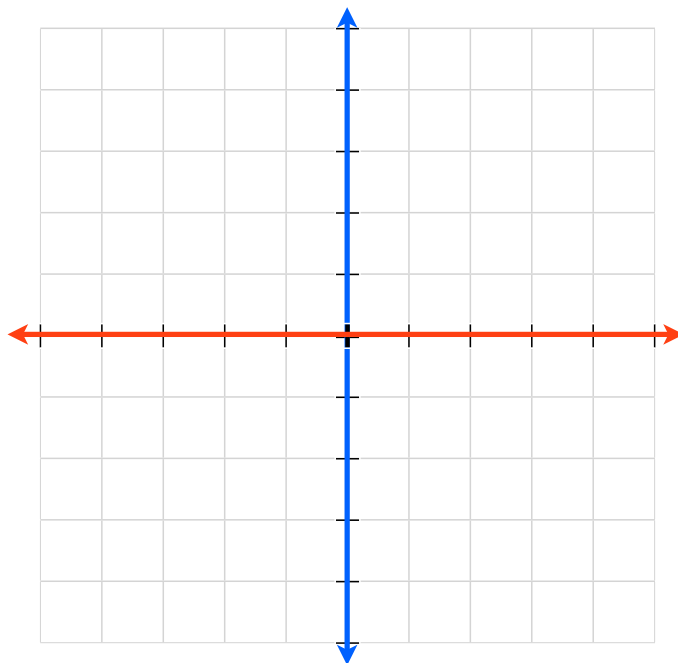Determine if the following lines are parallel or perpendicular.

Put equations in slope-intercept form

$$x + 4y = 12 \qquad\qquad 8x - 2y = 10$$

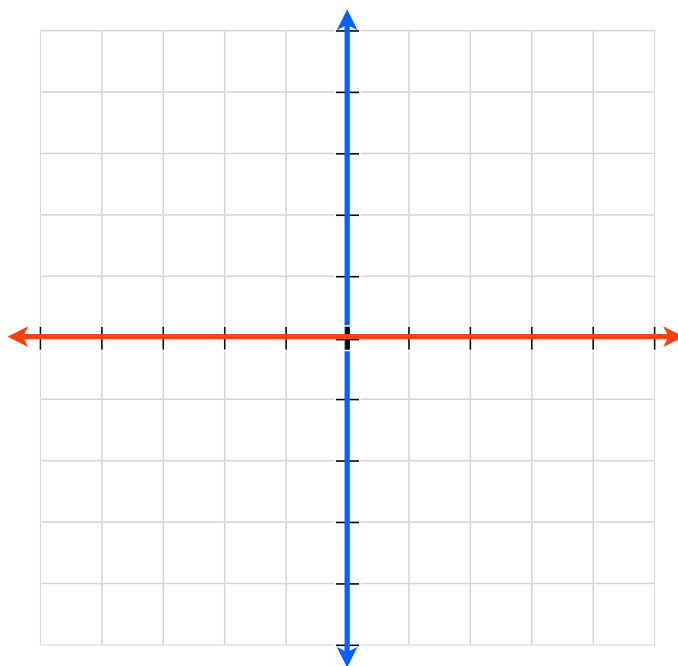Find the equation of the following line...

Parallel to $y = 3x + 4$

Through Point (1,-2)

Find the equation of the following line...

Perpendicular to $y = \dfrac{1}{4}x + 1$

Through Point (1,-3)

Find the equation of the following line...

Parallel to $y = -x + 4$
Through Point (5,6)

Find the equation of the following line...

Perpendicular to $y = 3x + 1$

Through Point (6,-3)

Parallel lines have the same slopes

Perpendicular lines have opposite reciprocal slopes