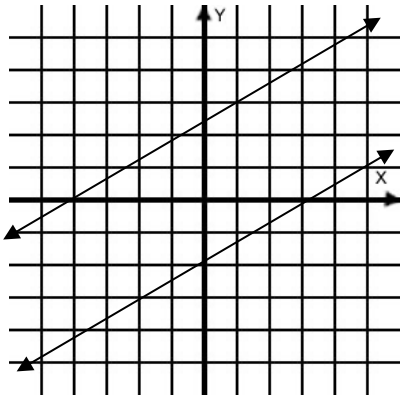
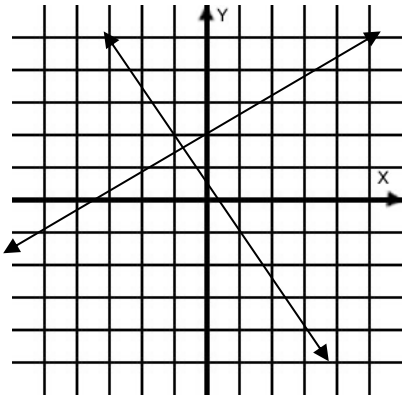
Parallel and Perpendicular Lines

Parallel Lines:
Have the same slope, but different y-intercepts.
The slope of both lines is $\frac{3}{5}$. They cross the y-axis at different points.



Vertical lines are considered parallel even though their slopes are undefined.

Perpendicular Lines:
Have slopes that are negative reciprocals of each other. The slope of one line is $\frac{3}{5}$; the other is $-\frac{5}{3}$.



Horizontal and vertical lines are considered to be perpendicular even though one slope is 0 and the other is undefined.

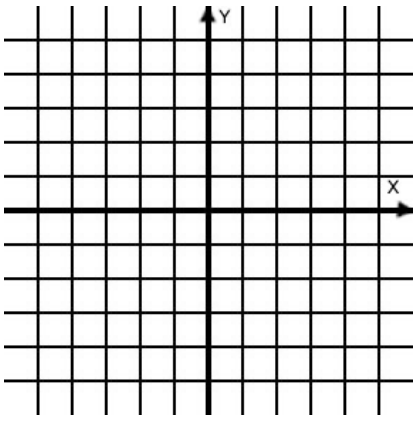
Determine if the following lines are parallel, perpendicular, or neither.

$L1$ through (-2, -3) and (4, 3) and $L2$
Line through (1, 3) and (3, 5)

Slope of $L1$: $m = \frac{-3-3}{-2-4} = \frac{-6}{-6} = 1$

Slope of $L2$: $m = \frac{3-5}{1-3} = \frac{-2}{-2} = 1$

$L1$ and $L2$ are _____

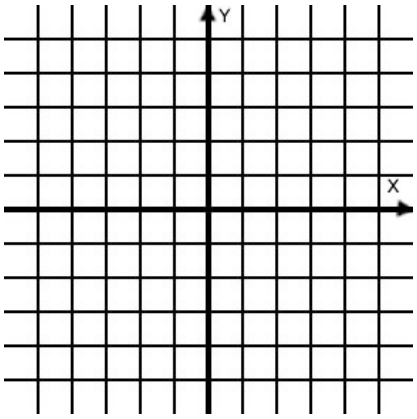


$L1$ through (5, 4) and (3, -1) and
$L2$ through (4, 1) and (-1, -2)

Slope of $L1$: $m = \frac{4 - -1}{5 - 3} = \frac{5}{2}$

Slope of $L2$: $m = \frac{1 - -2}{4 - -1} = \frac{3}{5}$

$L1$ and $L2$ are _____



$L1$ through (-2, 1) and (1, 5) and
$L2$ through (-1, -1) and (-5, 2)

Slope of $L1$: $m = \frac{1 - 5}{-2 - 1} = \frac{-4}{-3} = \frac{4}{3}$

Slope of $L2$:

$$m = \frac{-1 - 2}{-1 - -5} = \frac{-3}{4} = -\frac{3}{4}$$

$L1$ and $L2$ are _____