Chapter 3
Parallel and Perpendicular Lines

3.1 - Pairs of Lines and Angles

3.2 - Parallel Lines and Transversals

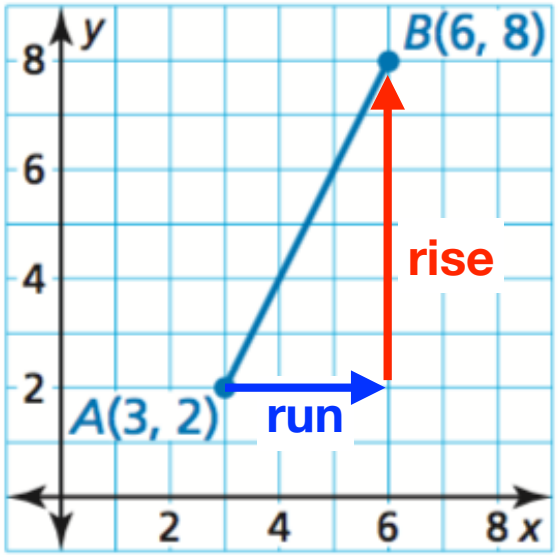
3.3 - Proofs with Parallel Lines

3.4 - Proofs with Perpendicular Lines

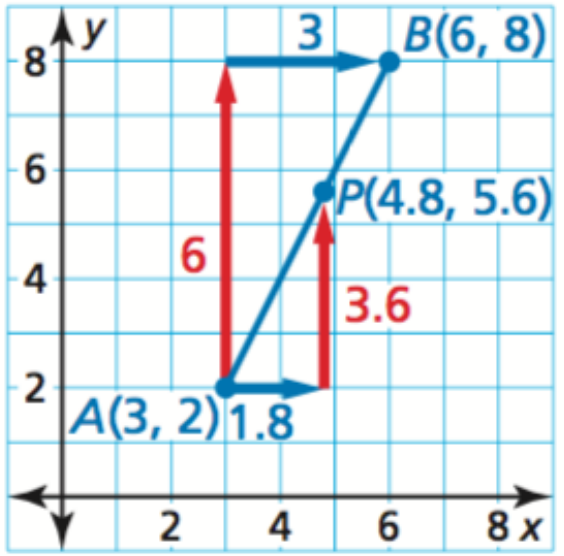
3.5 - Equations of Parallel and Perpendicular Lines

3.5 - Equations of Parallel and Perpendicular Lines

- **Directed Line Segment:** AB is a segment in a coordinate plane that represents moving from point A to point B.



Determine the coordinates of point P along segment AB such that AP to PB is 3 to 2.



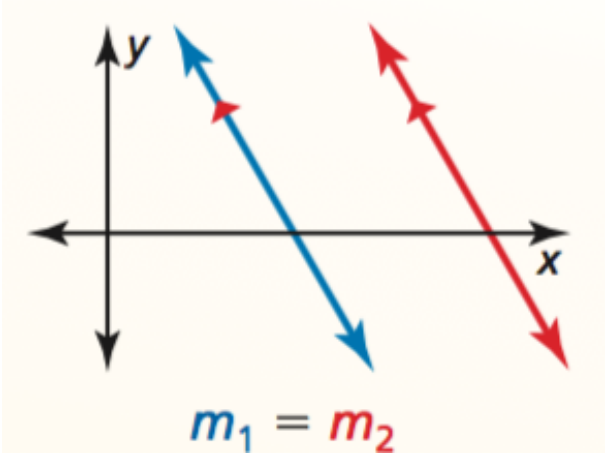
3.5 - Equations of Parallel and Perpendicular Lines

Slope of a line

- **Parallel lines**

  Two distinct non-vertical lines are parallel if and only if they have the same slope.

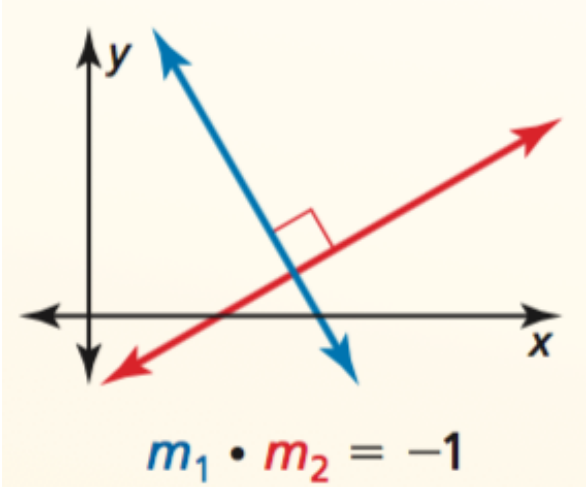
  In addition, any two vertical lines are parallel.



- **Perpendicular lines**

  Two non-vertical lines are perpendicular if and only if the product of their slopes is -1.

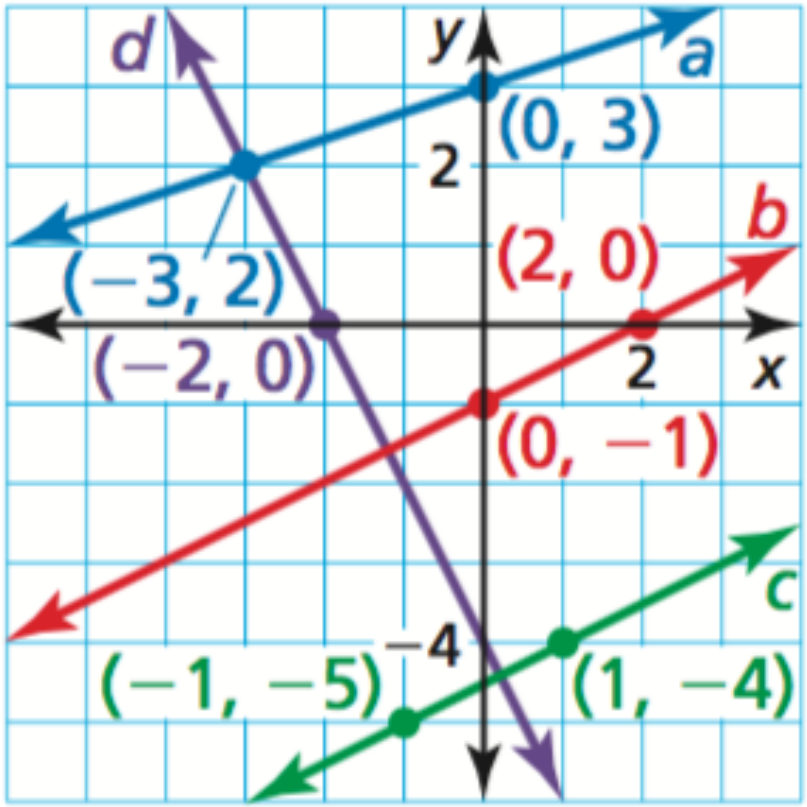
  In addition, horizontal lines are perpendicular to vertical lines.



3.5 - Equations of Parallel and Perpendicular Lines

Slope of a line

- Determine which of the lines are parallel and which of the lines are perpendicular.

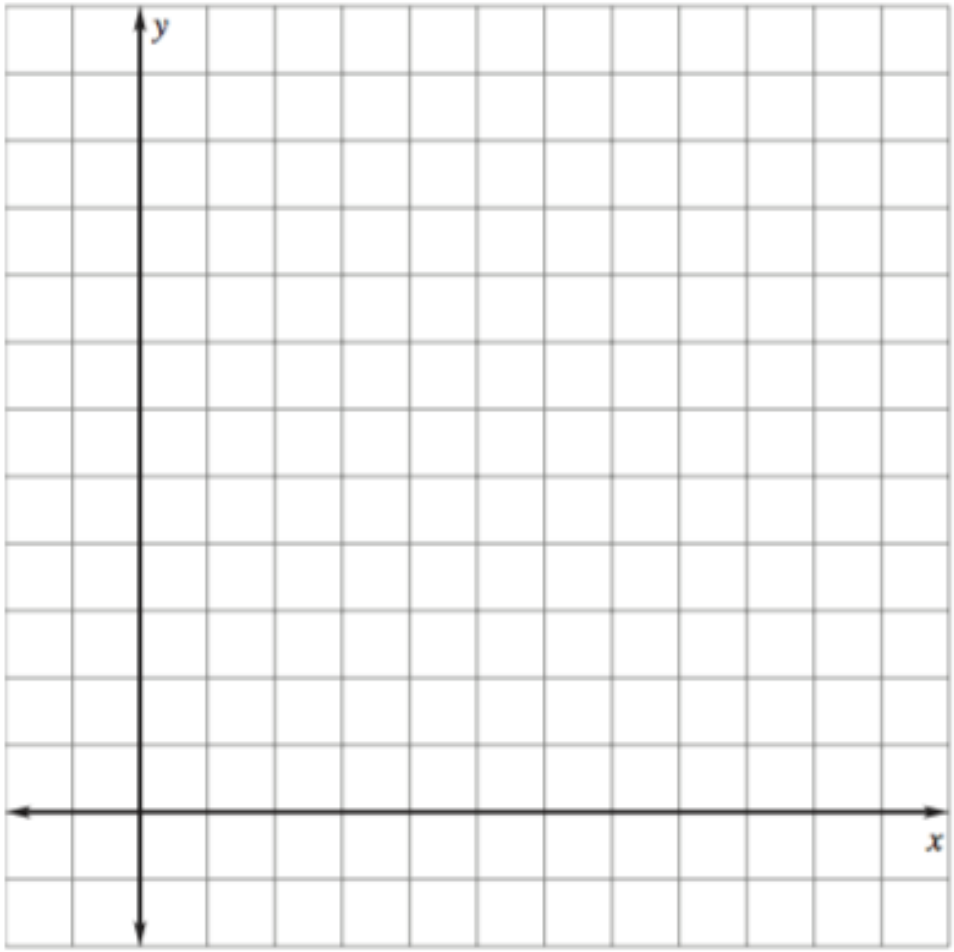


3.5 - Equations of Parallel and Perpendicular Lines

Write equations for parallel and perpendicular lines

1. Write an equation of the line passing through the point (-1, 1) that is parallel to the line $y = 2x - 3$.

2. Write an equation of the line passing through the point (2, 3) that is perpendicular to the line $2x + y = 2$.



3.5 - Equations of Parallel and Perpendicular Lines

Finding the Distance from a Point to a Line

1. Find the distance from the point (1, 0) to the line y = -x + 3.

2. Find the distance from the point (6, 4) to the line y = x + 4.