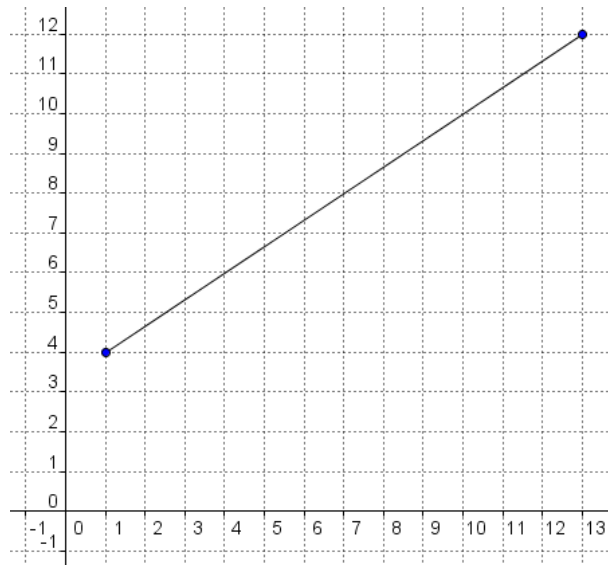


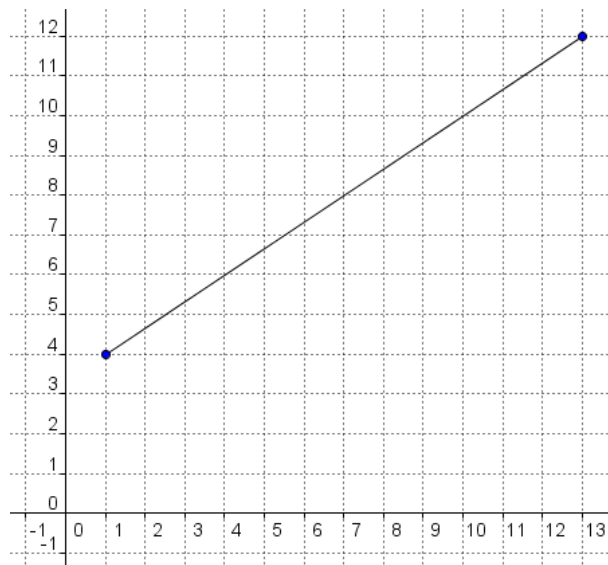
Midpoint, length and slope of a line segment

In Analytic Geometry we apply the concepts of slope, length and midpoint of a line segment to determine properties of lines, triangles, quadrilaterals . . . and circles.

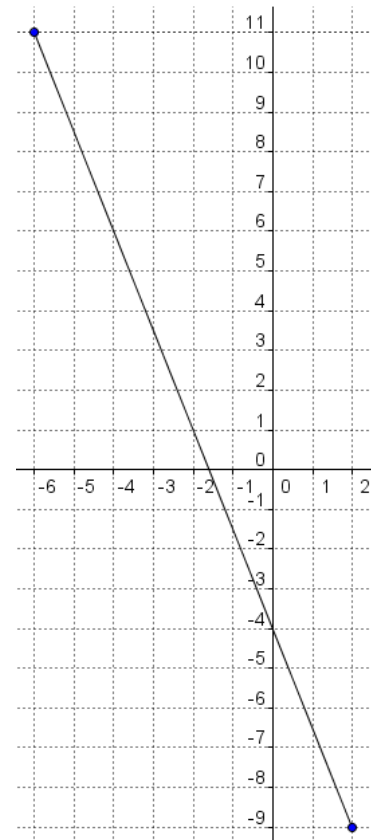
Slope and length are based on differences in x-values and y-values:



Midpoint is based on average x-values and y-values:



Example – Determine the slope, length and midpoint of the line segment below.



Example – Determine the slope, length and midpoint of the line segment that connects the points P $(-4.2, 5.1)$ and Q $(7.6, -1.3)$.

If we know the midpoint of a line segment and one of its endpoints then there are two different ways that we can determine the other endpoint:

Method 1: Apply the midpoint formula and opposite operations.

Method 2: Determine the rise and run from the endpoint to the midpoint.
Apply the same rise and run from the midpoint to the other endpoint.

Example – A line segment has one endpoint at C $(-5, 4)$ and midpoint M $(1, -3)$. Determine the other endpoint. Include a sketch to illustrate your answer.

Homework – Please solve the following problems and answer:
questions # 3ab, 5, 13, 29 on pages 66-69
questions # 2ad, 3, 12, 14 on pages 77-78

1. Determine the slope, length and midpoint of the line segment that connects the points P (1.6, -2.9) and Q (15.2, 7.3).
2. A line segment has one endpoint at C (-2, -5) and midpoint M (12, 1). Determine the other endpoint. Include a sketch to illustrate your answer.