6.1 Classwork: Midpoint formula
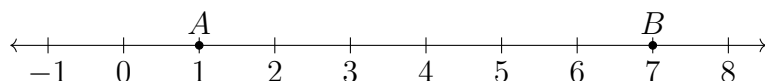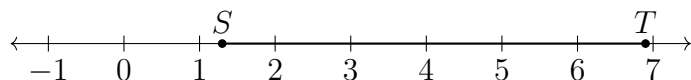
1. Given $\overleftrightarrow{AB}$ as shown on the number line, with $A = 1$ and $B = 7$.

   (a) Find the length AB, writing an equation

   (b) What is half the length?

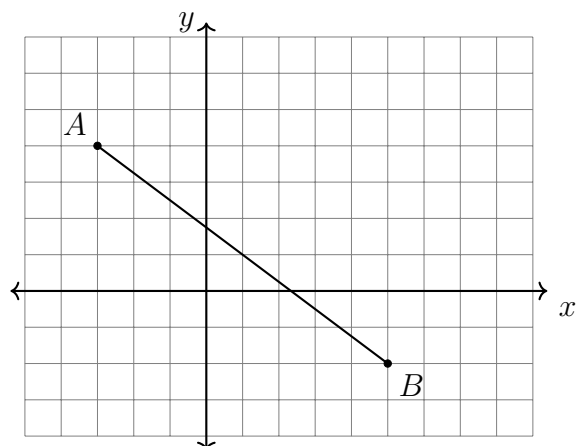   (c) Mark and label the midpoint M between A and B

2. Given $S(1.3)$ and $T(6.9)$, as shown on the number line. Mark and label the midpoint M that bisects $\overline{ST}$.
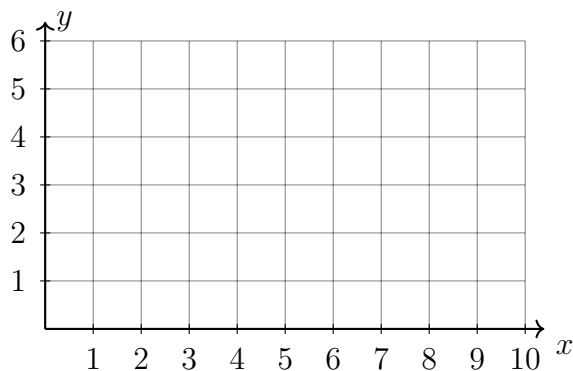

The midpoint formula

Given $A(x_A, y_A)$, $B(x_B, y_B)$, midpoint $M = \left(\dfrac{x_A + x_B}{2}, \dfrac{y_A + y_B}{2} \right)$

3. In the diagram below, $\overline{AB}$ has endpoints with coordinates $A(-3, 4)$ and $B(5, -2)$. Find the coordinates of the midpoint M of $\overline{AB}$. Mark and label it on the graph.
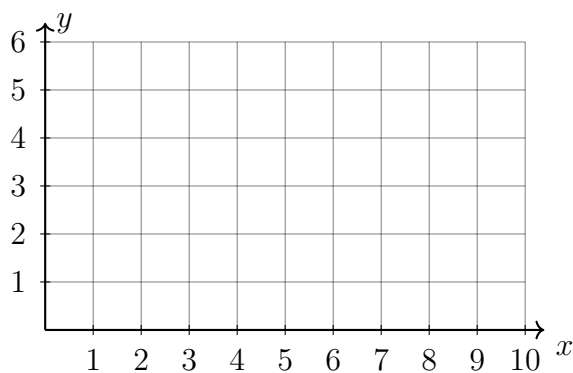
4. On the graph below, draw $\overline{AB}$, with $A(2,3)$ and $B(8,5)$, labeling the end points. Determine and state the coordinates of the midpoint M of $\overline{AB}$ and mark and label it on the graph.

5. Find the coordinates of the midpoint M of $\overline{RS}$, $R(-3,7)$ and $S(5,2)$. Mark and label it on the graph.
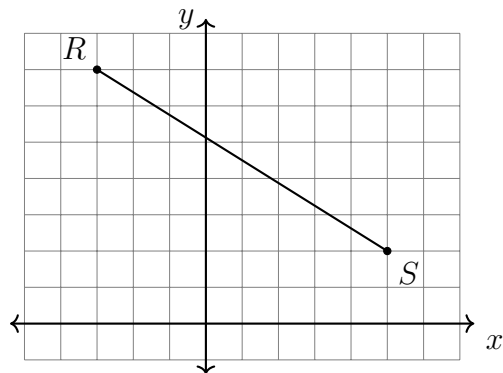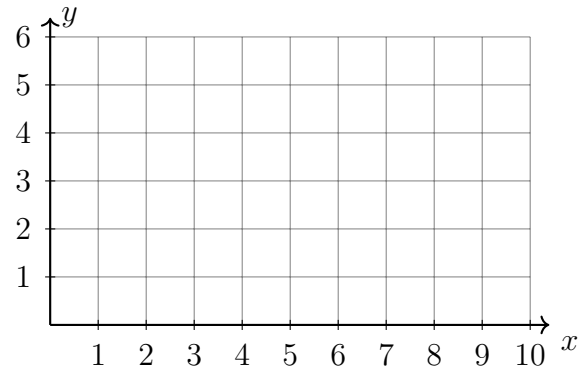

6. On the graph below, draw $\overline{AB}$, with $A(1,2)$ and $B(7,4)$, labeling the end points. Determine and state the coordinates of the midpoint M of $\overline{AB}$ and mark and label it on the graph.
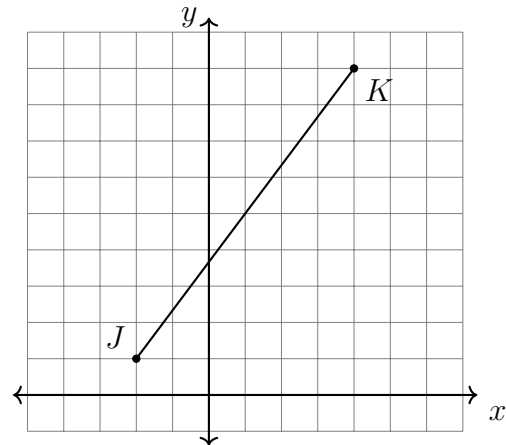
7. On the graph below, draw $\overline{EF}$, with $E(3,5)$ and $F(9,1)$, labeling the end points. Determine and state the coordinates of the midpoint M of $\overline{EF}$ and mark and label it on the graph.

8. In the diagram below, $\overline{JK}$ has endpoints $J(-2,1)$ and $K(4,9)$.

   (a) Find the coordinates of the midpoint M of $\overline{JK}$. Mark and label it on the graph.

   (b) Find the length JK

9. Given $M(1)$, the midpoint of $\overline{AB}$. Point $A = -3$, find the value of point B. Mark and label B on the graph.
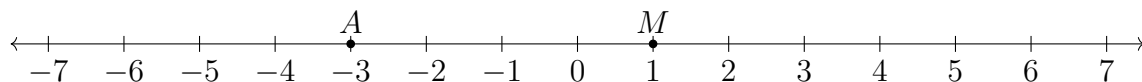
10. Given $A(-2.1)$ and $M(1.8)$, as shown on the number line. The point B is such that M bisects $\overline{AB}$.

Find the value of B. Mark and label it on the number line.

$$A \qquad\qquad\qquad M$$

$$-3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8$$