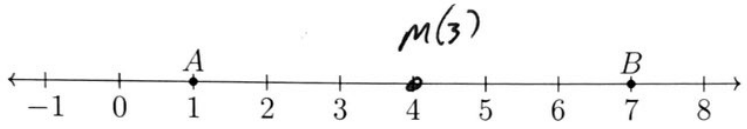
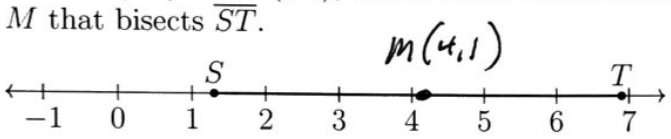
Name: SOLUTIONS

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 $\ell = 7 - 1 = 6$
   (b) What is half the length? $\ell/2 = \frac{6}{2} = 3$
   (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 $\overline{ST}$.



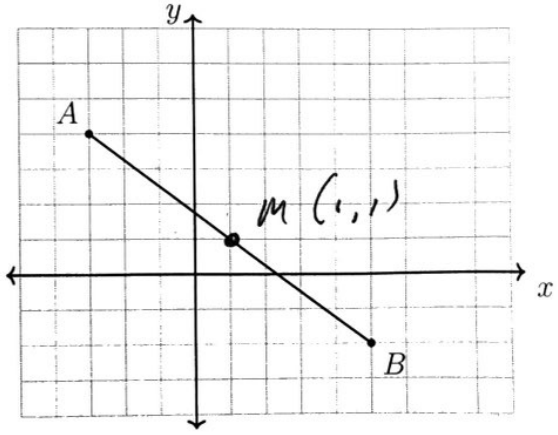
$$M = \frac{1.3 + 6.9}{2} = \frac{8.2}{2} = 4.1$$

The midpoint formula

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

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.

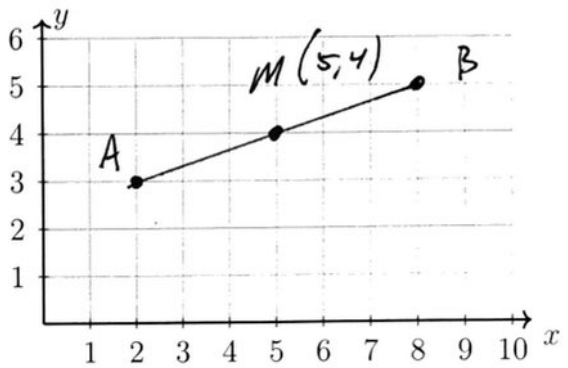
$$M = \left(\frac{-3+5}{2}, \frac{4+(-2)}{2}\right) = \left(\frac{2}{2}, \frac{2}{2}\right) = (1, 1)$$



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.

$M = \left(\frac{2+8}{2}, \frac{3+5}{2}\right)$

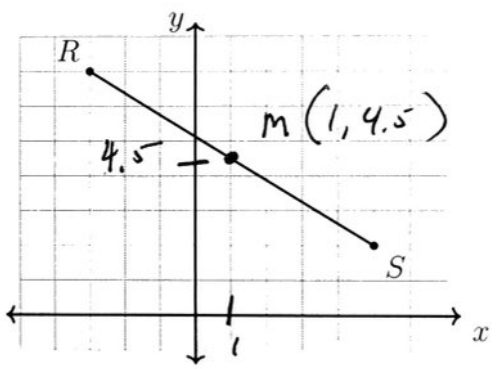
$= (5, 4)$



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.

$M = \left(\frac{-3+5}{2}, \frac{7+2}{2}\right)$

$= \left(1, \frac{9}{2}\right)$



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.

$M = \left(\frac{1+7}{2}, \frac{2+4}{2}\right)$

$= (4, 3)$