

Midpoint of a line 10NRF

A Review the method of finding the co-ordinates of the midpoint of a line segment.

- Line segment, PQ, has end points P(8, 4) and Q(2, 6).
 - Sketch the information on a diagram.
 - What are the co-ordinates of the midpoint?
- Find the co-ordinates of the midpoint of the line segment with these end points.

(a) A(1, 6), B(9, 6)	(b) D(-3, 3), E(-9, 3)	(c) G(6, -1), H(6, -7)
(d) M(-7, 4), N(-7, -4)	(e) P(4, 4), Q(8, 4)	(f) R(3, 8), S(3, 4)

- Find the midpoint of each line segment given by the co-ordinates of the end points.

(a) (-1, -2), (-7, 10)	(b) (6, 4), (0, 0)	(c) (5, -1), (-2, 9)
(d) (0, 0), (6, 4)	(e) (4, -5), (9, -6)	(f) (0, -4), (12, 0)
(g) (-2, 3), (3, 5)	(h) (5, 0), (-8, -3)	(i) (-7, -11), (-5, 0)

- Find the midpoint of each of the following.

(a) AB A(5, 3), B(1, 5)	(b) CD C(-4, -5), D(2, 3)	(c) EF E(-6, 3), F(6, -7)
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B Remember: When you answer a problem, make a final statement.

- A diameter of a circle has end points A(9, -4) and B(3, -2). Find the centre of the circle.
 - The end points of AB are A($\sqrt{72}$, $-\sqrt{12}$) and B($\sqrt{32}$, $-\sqrt{48}$). Find the midpoint.
- Find the midpoint of each side of $\triangle ABC$ whose vertices are A(12, 4), B(-6, 2), and C(-4, -2).
- One end point of line segment AB is A(-2, 4). If the co-ordinates of the midpoint are (-1, 7), find the co-ordinates of B.
- If the midpoint of a segment is (-1, -8) and one end point is (7, -9), find the co-ordinates of the remaining end point.
- D(-5, 8), E(-5, -6), and F(9, 8) are the vertices of $\triangle DEF$.
 - Find the midpoint M of DE.
 - Find the midpoint N of DF.
 - Find the length of MN.
 - Find the length of the base EF.
 - How do the lengths of MN and EF compare?
- The vertices of $\triangle ABC$ are A(2, 8), B(-2, -8), and C(-14, 4). P and Q are the midpoints of AB and AC.
 - Sketch a diagram of the given information.
 - Use co-ordinates to show that $PQ = \frac{1}{2} BC$.
- B(-2, 16), C(10, 4), D(-2, -8), and E(-14, 4) are the vertices of a square.
 - Show that the diagonals are equal in length.
 - Show that the diagonals bisect each other.
- If 2893 digits are used to number the pages of a book, how many pages does the book have?

4.9 Exercise, page 168
 1. b) (5, 5) 2. a) (5, 6) b) (-6, 3) c) (6, -4) d) (-7, 0) e) (6, 4)
 f) (3, 6) 3. a) (-4, 4) b) (3, 2) c) ($\frac{3}{2}$, 4) d) (3, 2) e) ($\frac{13}{2}$, $-\frac{11}{2}$)
 f) (6, -2) g) ($\frac{1}{2}$, 4) h) ($-\frac{3}{2}$, $-\frac{3}{2}$) i) ($-\frac{11}{2}$, $-\frac{11}{2}$) 4. a) (3, 4)
 b) (-1, -1) c) (0, -2) 5. a) (6, -3) b) ($5\sqrt{2}$, $-3\sqrt{3}$)
 6. AB: (3, 3), AC: (4, 1), BC: (-5, 0) 7. B(0, 10)
 8. (-9, -7) 9. a) (-5, 1) b) (2, 8) c) $7\sqrt{2}$ units d) $14\sqrt{2}$ units
 e) $MN = \frac{1}{2} EF = 12$. 1000