

Boost Free Lessons - Year 10 Maths

Lesson 12: Midpoint of an Interval

Name: _____ Grade: _____ Date: _____

Worked Example 1

Find the midpoint of A(2, 3) and B(8, 9).

1. The midpoint is simply the average of the two x values and the average of the two y values.
2. $M = (\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$.
3. For x: $\frac{2 + 8}{2} = 5$.
4. For y: $\frac{3 + 9}{2} = 6$.

M = (5, 6)

Worked Example 2

M(4, 1) is the midpoint of A(1, -2) and B. Find the coordinates of B.

1. Let B = (x, y) and use the midpoint formula in reverse.
2. For x: $\frac{1 + x}{2} = 4$, so $1 + x = 8$ and $x = 7$.
3. For y: $\frac{-2 + y}{2} = 1$, so $-2 + y = 2$ and $y = 4$.
4. Check: the midpoint of (1, -2) and (7, 4) is (4, 1) (correct).

B = (7, 4)

Remember: The midpoint is the average of the coordinates: add the two x values and halve, then do the same with the y values. To find a missing endpoint, work the formula backwards.



Question 1: Find the midpoint of each pair of points.

1. $(0, 0)$ and $(4, 6)$

2. $(1, 3)$ and $(5, 7)$

3. $(2, 4)$ and $(8, 10)$

4. $(-2, 1)$ and $(4, 5)$

5. $(0, 5)$ and $(6, 1)$

6. $(-3, -2)$ and $(5, 6)$

7. $(7, 2)$ and $(1, 8)$

8. $(-4, 3)$ and $(2, -1)$



Question 2: Answer the following.

1. $(1, 2)$ and $(4, 5)$

2. $(0, 1)$ and $(3, 6)$

3. $M(3, 4)$ is the midpoint of $(1, 2)$ and B . Find B .

4. $M(0, 0)$ is the midpoint of $(-3, 5)$ and B . Find B .

5. $(-5, 2)$ and $(3, -4)$

6. $M(2, 5)$ is the midpoint of $(-1, 3)$ and B . Find B .



Question 3: Answer the following questions.

1. Find the midpoint of $(0, 0)$ and $(10, 6)$.
2. A diameter of a circle joins $(2, 1)$ and $(8, 7)$. Find the centre of the circle.
3. $M(6, 2)$ is the midpoint of $A(2, -3)$ and B . Find B .
4. A rectangle has opposite corners at $(1, 1)$ and $(7, 5)$. Find its centre.
5. Find the midpoint of $(-6, -2)$ and $(-2, -8)$.





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Answers: Midpoint of an Interval

Question 1

- | | |
|-----------|------------|
| 1. (2, 3) | 5. (3, 3) |
| 2. (3, 5) | 6. (1, 2) |
| 3. (5, 7) | 7. (4, 5) |
| 4. (1, 3) | 8. (-1, 1) |

Question 2

- | | |
|---------------|----------------|
| 1. (2.5, 3.5) | 4. B = (3, -5) |
| 2. (1.5, 3.5) | 5. (-1, -1) |
| 3. B = (5, 6) | 6. B = (5, 7) |

Question 3

1. (5, 3)
2. (5, 4)
3. B = (10, 7)
4. (4, 3)
5. (-4, -5)

