Midpoint

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Find the midpoint of $(2, 4)$ and $(8, 10)$. [2 marks]

Average coordinates: $\frac{2+8}{2} = 5$ and $\frac{4+10}{2} = 7$.

Answer: $(5, 7)$

2. Find the midpoint of $(-6, 3)$ and $(2, -5)$. [2 marks]

$\frac{-6+2}{2} = -2$ and $\frac{3-5}{2} = -1$.

Answer: $(-2, -1)$

3. Find the midpoint of $(-1, -4)$ and $(4, 5)$. [2 marks]

$\frac{-1+4}{2} = 1.5$ and $\frac{-4+5}{2} = 0.5$.

Answer: $(1.5, 0.5)$

4. One endpoint is $(1, 6)$ and the midpoint is $(4, 2)$. Find the other endpoint. [3 marks]

Double the midpoint: $(8, 4)$.

Subtract $(1, 6)$ to obtain $(7, -2)$.

Answer: $(7, -2)$

5. The endpoints of a diameter are $(-4, 1)$ and $(8, 5)$. Find the circle's centre. [2 marks]

The centre is the midpoint of the diameter.

$(\frac{-4+8}{2}, \frac{1+5}{2}) = (2, 3)$.

Answer: $(2, 3)$

6. A student says the midpoint of $(2, 1)$ and $(10, 7)$ is $(6, 4)$. Verify this using coordinate differences. [3 marks]

From $(2, 1)$ to $(6, 4)$ the changes are $(4, 3)$.

From $(6, 4)$ to $(10, 7)$ the changes are also $(4, 3)$.

Equal steps on the same segment place the point halfway.

Answer: The student is correct.