

Midpoint Formula

Example: The endpoints of the line segment are $(-1, 2)$ and $(7, u)$; the midpoint is $(3, -5)$. Find the value of the unknown.

$$\text{Midpoint} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) \Rightarrow (3, -5) = \left(\frac{-1+7}{2}, \frac{2+u}{2} \right)$$

$$\Rightarrow 3 = \left(\frac{-1+7}{2} \right), -5 = \left(\frac{2+u}{2} \right) \Rightarrow -10 = 2+u$$

$$\mathbf{u = -12}$$

The endpoints and the

the value of the unknown.

- 1) Endpoints : $(9, t), (q, -9)$
Midpoint : $(u, 6)$

$(6, p)$
 $(2, 5)$

$t = \underline{\hspace{2cm}}, u = \underline{\hspace{2cm}}$

$q = \underline{\hspace{2cm}}$

- 3) Endpoints : $(m, -3), (12, 5)$
Midpoint : $(-7, -)$

$(h, 7)$
 $(3, 6)$

$m = \underline{\hspace{2cm}}$

- 5) Endpoints : $(-6, -), (1, 12)$
Midpoint : $(3, y)$

$(-9, c), (1, 12)$
 $(d, 7)$

$x = \underline{\hspace{2cm}}, y = \underline{\hspace{2cm}}$

$c = \underline{\hspace{2cm}}, d = \underline{\hspace{2cm}}$

- 7) Endpoints : $(8, -12), (6, -n)$
Midpoint : $(7, -10)$

- 8) Endpoints : $(-5, z), (3, -9)$
Midpoint : $(-1, -11)$

$n = \underline{\hspace{2cm}}$

$z = \underline{\hspace{2cm}}$

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