

## Midpoint Formula

Sheet 1

**Example:** The endpoints of the line segment are  $(4, a)$  and  $(b, -1)$ ; the midpoint is  $(-4, 12)$ . Find the value of the unknown.

$$\text{Midpoint} = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) \Rightarrow (-4, 12) = \left( \frac{4 + b}{2}, \frac{a - 1}{2} \right)$$

$$\Rightarrow -4 = \left( \frac{4 + b}{2} \right), 12 = \left( \frac{a - 1}{2} \right) \Rightarrow -8 = 4 + b, 24 = a - 1$$

$$\mathbf{a = 25, b = -12}$$

The endpoints and the

the value of the unknown.

1) Endpoints :  $(u, -3)$   
Midpoint :  $(9, v)$

$(-5, 10), (n, 6)$   
 $(3, 8)$

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

3) Endpoints :  $(2, 5)$ ,  
Midpoint :  $(1, 6)$

$(9, c), (d, -1)$   
 $(5, 9)$

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

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

5) Endpoints :  $(q, -1)$ ,  
Midpoint :  $(3, -4)$

$(-6, -8), (z, 0)$   
 $(-7, -4)$

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

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

7) Endpoints :  $(3, -10), (-7, 8)$   
Midpoint :  $(-2, t)$

8) Endpoints :  $(g, 4), (11, 2)$   
Midpoint :  $(5, h)$

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

$g = \underline{\hspace{2cm}}, h = \underline{\hspace{2cm}}$

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