Name : _____ Score : _____

Midpoint Formula

Sheet 3

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

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

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

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

The endpoints and the ... e value of the unknown.

1) Endpoints : (9, t), (... q, –9), (6, p)
Midpoint : (u, 6) ... 2, 5)

t = _____ , u = _____ , q = _____

3) Endpoints : (m, –3 ... 12, 5), (h, 7)
Midpoint : (–7, –5 ... 3, 6)

m = _____

5) Endpoints : (–6, –2 ... -9, c), (1, 12)
Midpoint : (3, y) ... d, 7)

x = _____ , y = _____ c = _____ , d = _____

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

n = _____

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

z = _____

Name : _____ Score : _____

Answer key

Sheet 3

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.

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

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

u = –12

The endpoints and the midpoint are given. Find the value of the unknown.

1) Endpoints : (9, t), (q, –9), (6, p)
Midpoint : (u, 6) (2, 5)

t = **0** , u = , q = **–2**

3) Endpoints : (m, –3 (12, 5), (h, 7)
Midpoint : (–7, – (3, 6)

m = **–15**

5) Endpoints : (–6, – (–9, c), (1, 12)
Midpoint : (3, y) (d, 7)

x = **12** , y = **4** c = **2** , d = **–4**

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

n = **8**

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

z = **–13**