

**DIRECTIONS:** Find (a) the distance between each pair of points, and (b) the midpoint of the line segment connecting the points. Express all radicals in simplest form.

1.  $(13, 6), (0, 6)$

$$\begin{aligned} &13 \\ &\left(\frac{13}{2}, 6\right) \end{aligned}$$

2.  $(0, 8), (-6, 0)$

$$\begin{aligned} &10 \\ &(-3, 4) \end{aligned}$$

3.  $(0, 6), (-5, -1)$

$$\begin{aligned} &\sqrt{74} \\ &\left(-\frac{5}{2}, \frac{5}{2}\right) \end{aligned}$$

4.  $(9, 1), (2, -1)$

$$\begin{aligned} &\sqrt{53} \\ &\left(\frac{11}{2}, 0\right) \end{aligned}$$

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

$$\begin{aligned} &2\sqrt{5} \\ &(4, 4) \end{aligned}$$

6.  $(-4, -3), (2, 1)$

$$\begin{aligned} &2\sqrt{13} \\ &(-1, -1) \end{aligned}$$

7.  $(2, 2), \left(\frac{1}{3}, -2\right)$

$$\begin{aligned} &\frac{13}{3} \\ &\left(\frac{7}{6}, 0\right) \end{aligned}$$

8.  $\left(\frac{1}{2}, -1\right), (-1, 1)$

$$\begin{aligned} &\frac{5}{2} \\ &\left(-\frac{1}{4}, 0\right) \end{aligned}$$

9.  $(0, 0), (11, 11)$

$$\begin{aligned} &11\sqrt{2} \\ &\left(\frac{11}{2}, \frac{11}{2}\right) \end{aligned}$$

10.  $(0, 0), (5, 5)$

$$\begin{aligned} &5\sqrt{2} \\ &\left(\frac{5}{2}, \frac{5}{2}\right) \end{aligned}$$

11.  $(\sqrt{2}, 1), (-\sqrt{2}, 0)$

$$\begin{aligned} &3 \\ &\left(0, \frac{1}{2}\right) \end{aligned}$$

12.  $(5, \sqrt{5}), (3, -\sqrt{5})$

$$\begin{aligned} &2\sqrt{6} \\ &(4, 0) \end{aligned}$$

13.  $(1 + \sqrt{5}, 2 + \sqrt{3}), (1 - \sqrt{5}, -2 + \sqrt{3})$

$$\begin{aligned} &6 \\ &(1, \sqrt{3}) \end{aligned}$$

14.  $(\sqrt{6} + 1, \sqrt{3} - \sqrt{2}), (\sqrt{6} - 1, \sqrt{3} + \sqrt{2})$

$$\begin{aligned} &2\sqrt{3} \\ &(\sqrt{6}, \sqrt{3}) \end{aligned}$$

15.  $(a, b), (0, b)$

$$\begin{aligned} &|a| \\ &\left(\frac{a}{2}, b\right) \end{aligned}$$

16.  $(-a, b), (2a, 4b)$

$$\begin{aligned} &3\sqrt{a^2 + b^2} \\ &\left(\frac{a}{2}, \frac{5b}{2}\right) \end{aligned}$$

17.  $(a + b, a - b), (b - a, b + a)$

$$\begin{aligned} &2\sqrt{a^2 + b^2} \\ &(b, a) \end{aligned}$$

18.  $(a, \sqrt{ab}), (b, -\sqrt{ab})$

$$\begin{aligned} &|a + b| \\ &\left(\frac{a+b}{2}, 0\right) \end{aligned}$$

**DIRECTIONS:**  $M$  is the midpoint of  $\overline{PQ}$ . Find the coordinates of  $Q$ .

19.  $P(0, 0), M(3, 5)$

$$(6, 10)$$

20.  $P(-4, 3), M(0, 0)$

$$(4, -3)$$

21.  $P(-4, 0), M(3, 3)$

$$(10, 6)$$

22.  $P(6, -2), M(0, 5)$

$$(-6, 12)$$

23.  $P(h, k), M(0, 0)$

$$(-h, -k)$$

24.  $P(0, 0), M(h, k)$

$$(2h, 2k)$$