

Find the distance between the given two points. Give exact answers

<p>1. (-2, 8), (6, 0)</p> $d = \sqrt{(6 - (-2))^2 + (0 - 8)^2}$ $= \sqrt{8^2 + (-8)^2} = \sqrt{128} = \boxed{8\sqrt{2}}$	<p>2. (-3, -1), (7, 4)</p> $d = \sqrt{(7 - (-3))^2 + (4 - (-1))^2}$ $= \sqrt{10^2 + 5^2} = \sqrt{125} = \boxed{5\sqrt{5}}$
<p>3. (-5, 8), (1, 6)</p> $d = \sqrt{(1 - (-5))^2 + (6 - 8)^2}$ $= \sqrt{6^2 + (-2)^2} = \sqrt{40} = \boxed{2\sqrt{10}}$	<p>4. (-2, 10), (10, -2)</p> $d = \sqrt{(10 - (-2))^2 + (-2 - 10)^2}$ $= \sqrt{12^2 + (-12)^2} = \sqrt{288} = \boxed{12\sqrt{2}}$
<p>5. (8, 3), (2, -1)</p> $d = \sqrt{(2 - 8)^2 + (-1 - 3)^2}$ $= \sqrt{(-6)^2 + (-4)^2} = \sqrt{52} = \boxed{2\sqrt{13}}$	<p>6. (-10, -15), (-4, -8)</p> $d = \sqrt{(-4 - (-10))^2 + (-8 - (-15))^2}$ $= \sqrt{6^2 + 7^2} = \boxed{\sqrt{85}}$

Find the Midpoint between the given two points.

<p>7. (3, -7), (-3, 1)</p> $M = \left(\frac{3 + (-3)}{2}, \frac{-7 + 1}{2} \right) = \left(\frac{0}{2}, \frac{-6}{2} \right) = \boxed{(0, -3)}$	<p>8. (2, 2), (6, 14)</p> $M = \left(\frac{2 + 6}{2}, \frac{2 + 14}{2} \right) = \left(\frac{8}{2}, \frac{16}{2} \right) = \boxed{(4, 8)}$
<p>9. (0, -6), (-4, 9)</p> $M = \left(\frac{0 + (-4)}{2}, \frac{-6 + 9}{2} \right) = \left(\frac{-4}{2}, \frac{3}{2} \right) = \boxed{\left(-2, \frac{3}{2}\right)}$	<p>10. (9, -2), (3, 6)</p> $M = \left(\frac{9 + 3}{2}, \frac{-2 + 6}{2} \right) = \left(\frac{12}{2}, \frac{4}{2} \right) = \boxed{(6, 2)}$
<p>11. (-5, 8), (1, 6)</p> $M = \left(\frac{-5 + 1}{2}, \frac{8 + 6}{2} \right) = \left(\frac{-4}{2}, \frac{14}{2} \right) = \boxed{(-2, 7)}$	<p>12. (-5, 4), (2, -4)</p> $M = \left(\frac{-5 + 2}{2}, \frac{4 + (-4)}{2} \right) = \left(\frac{-3}{2}, \frac{0}{2} \right) = \boxed{\left(-\frac{3}{2}, 0\right)}$

13. The point (1, -12) is the midpoint of segment \overline{AB} . If the coordinates of point A are $(3, 4)$, find the coordinates of point B (x_2, y_2)

① Set up equation

$$(1, -12) = \left(\frac{3 + x_2}{2}, \frac{4 + y_2}{2} \right)$$

② separate equation into 2 parts

$$1 = \frac{3 + x_2}{2} \quad 2 = 3 + x_2$$

$$\boxed{-1 = x_2}$$

$$-12 = \frac{4 + y_2}{2}$$

$$-24 = 4 + y_2 \quad \boxed{y_2 = -28}$$

Answer: $(-1, -28)$

14. If the distance between points A and B is $3\sqrt{2}$ units and point A is (-2, 6), find the values of x if point B is $(x, 3)$

$$(3\sqrt{2})^2 = \sqrt{(x - (-2))^2 + (3 - 6)^2}^2$$

$$18 = (x + 2)^2 + 9$$

$$\sqrt{9} = \sqrt{(x + 2)^2}$$

$$\pm 3 = x + 2$$

$$-2 \pm 3 = x$$

$x = 1$ or $x = -5$

- Answers: 1) $8\sqrt{2}$ 2) $5\sqrt{5}$ 3) $2\sqrt{10}$ 4) $12\sqrt{2}$ 5) $2\sqrt{13}$ 6) $\sqrt{85}$ 7) (0, -3) 8) (4, 8)
 9) (-2, 1.5) 10) (6, 2) 11) (-2, 7) 12) (-1.5, 0) 13) (-1, -28) 14) $x = 1$ or $x = -5$