

Getting Ready

In this chapter, you will be working with the distance formula, second-degree equations, algebraic expressions, and key features of conic sections. You will also be dealing with radicals. These exercises will help you warm up for the work ahead.

- Determine what value must be added to each expression to form a perfect square trinomial.
 - $x^2 + 4x + \blacksquare$
 - $x^2 - 6x + \blacksquare$
 - $x^2 - 5x + \blacksquare$
 - $x^2 - x + \blacksquare$
 - $x^2 + 3x + \blacksquare$
- Factor each trinomial.
 - $x^2 + 2x + 1$
 - $x^2 + 4x + 4$
 - $x^2 - 8x + 16$
 - $5x^2 - 30x + 45$
 - $2x^2 - 28x + 98$
- State the vertex and the axis of symmetry for each parabola.
 - $y = x^2$
 - $y = 2x^2 - 3$
 - $y = (x - 2)^2 + 6$
 - $y = 3(x + 1)^2 - 1$
 - $y = 2(x - 4)^2$
- Sketch the graph of each parabola in question 3.
- State the equation of each circle with centre $(0, 0)$ and the given radius, r .
 - $r = 5$
 - $r = 8$
 - $r = \sqrt{2}$
 - $r = \sqrt{15}$
 - $r = 3\sqrt{2}$
- Find the distance between each pair of points.
 - $A(3, 2), B(2, 3)$
 - $A(0, 3), B(-1, 2)$
 - $A(-4, 6), B(8, 5)$
 - $A(0, 0), B(-3, 5)$
 - $A(-2, 5), B(-3, 6)$
- State the slope and the x - and y -intercepts of each line.
 - $2x - 3y = 6$
 - $x + y = 8$
 - $y = -3$
 - $y = 2x + 1$
 - $8x + 2y + 24 = 0$
 - $y = 4x - 8$
 - $x = 2$
- Determine the equation of each line. Express each equation in the standard form, $Ax + By + C = 0$.
 - The slope is 4 and the y -intercept is 2.
 - The x -intercept is 3 and the y -intercept is 4.
 - The line is parallel to the line $y = 2x - 1$ and passes through $(1, 4)$.
 - The line is parallel to the x -axis and passes through $(3, 5)$.
 - The line is perpendicular to the line $y = x - 5$ and passes through $(-2, 6)$.

- 9.** State the following.
- (a) the coordinates of the point that is 5 units below $(2, 3)$
 - (b) the coordinates of the point that is 3 units to the left of $(-1, 6)$
 - (c) the equation of the line that is parallel to, and 3 units below, the x -axis
 - (d) the equation of the line that is parallel to, and 2 units to the right, of the y -axis
- 10.** Find the intersection point for each pair of lines.
- (a) $y = 2x - 4$ and $y = x - 1$
 - (b) $y = -2x$ and $3x - 2y = -7$
 - (c) $y = 2x - 1$ and $y = 5$
 - (d) $4x - y = -3$ and $y = 9 - 2x$
- 11.** Simplify.
- (a) $(\sqrt{3})^2$
 - (b) $(\sqrt{2x})^2$
 - (c) $(\sqrt{x+5})^2$
 - (d) $(\sqrt{4x-3})^2$
 - (e) $\sqrt{7^2}$
 - (f) $\sqrt{x^2}$
 - (g) $\sqrt{(x-5)^2}$
 - (h) $\sqrt{(3x+9)^2}$
- 12.** Solve for y in each equation.
- (a) $2x - y = 5$
 - (b) $2x + 6y + 12 = 0$
 - (c) $y^2 = x + 5$
 - (d) $x = (y + 1)^2 - 3$
 - (e) $x = 2(y - 3)^2 + 4$
 - (f) $x = -(y - 2)^2 - 7$
 - (g) $x^2 + y^2 = 9$
- 13.** Graph each curve and then state the domain and the range.
- (a) $y = 2x + 3$
 - (b) $y = \sqrt{x + 2}$
 - (c) $x^2 + y^2 = 25$
 - (d) $y = 3$
 - (e) $y = -x^2 + 2$
 - (f) $2x - 5y = 10$
 - (g) $2x^2 + 2y^2 = 32$
 - (h) $y = (x + 1)^2 - 4$
 - (i) $x = (y - 2)^2 + 3$
 - (j) $x = -4$
 - (k) $y = \frac{1}{x+2}$
 - (l) $y = \frac{x}{x^2-9}$
- 14.** Express each equation in vertex form by completing the square.
- (a) $y = x^2 + 10x - 8$
 - (b) $y = x^2 + 7x + 2$
 - (c) $y = 2x^2 + 4x - 5$
 - (d) $y = -3x^2 + 5x + 1$
 - (e) $y = 4x^2 - 9x - 6$
 - (f) $y = -5x^2 + x + 10$