

Skills Practice: Converting General Form to Standard Form.

Directions: Write each circle in Standard Form by completing the square. Then state the center and radius.

1. $x^2 + y^2 + 6x - 6y - 31 = 0$

$$x^2 + 6x + \frac{9}{1} + y^2 - 6y + \frac{9}{1} = 31 + \frac{9}{1} + \frac{9}{1}$$
$$\downarrow \qquad \qquad \qquad \downarrow$$
$$\frac{6}{2} = (3)^2 \qquad \qquad \frac{-6}{2} = (-3)^2$$

$$(x+3)^2 + (y-3)^2 = 49$$

Center: $(-3, 3)$
radius: 7

2. $x^2 + y^2 + 2x + 10y - 10 = 0$

$$x^2 + 2x + \frac{1}{1} + y^2 + 10y + \frac{25}{1} = 10 + \frac{1}{1} + \frac{25}{1}$$
$$\downarrow \qquad \qquad \qquad \downarrow$$
$$\frac{2}{2} = (1)^2 \qquad \qquad \frac{10}{2} = (5)^2$$

$$(x+1)^2 + (y+5)^2 = 36$$

Center: $(-1, -5)$
radius: 6

3. $x^2 + y^2 + 16x - 14y + 97 = 0$

$$x^2 + 16x + \frac{64}{1} + y^2 - 14y + \frac{49}{1} = -97 + \frac{64}{1} + \frac{49}{1}$$
$$\downarrow \qquad \qquad \qquad \downarrow$$
$$\frac{16}{2} = (8)^2 \qquad \qquad \frac{-14}{2} = (-7)^2$$

$$(x+8)^2 + (y-7)^2 = 16$$

Center: $(-8, 7)$
radius: 4

4. $x^2 + y^2 + 20x + 12y + 120 = 0$

$$x^2 + 20x + \frac{100}{1} + y^2 + 12y + \frac{36}{1} = -120 + \frac{100}{1} + \frac{36}{1}$$
$$\downarrow \qquad \qquad \qquad \downarrow$$
$$\frac{20}{2} = (10)^2 \qquad \qquad \frac{12}{2} = (6)^2$$

$$(x+10)^2 + (y+6)^2 = 16$$

Center: $(-10, -6)$
radius: 4

$$5. x^2 + y^2 - 22x + 4y + 89 = 0$$

$$x^2 - 22x + \frac{121}{4} + y^2 + 4y + \frac{4}{4} = -89 + \frac{121}{4} + \frac{4}{4}$$
$$-\frac{22}{2} = (-11)^2 \quad \frac{4}{2} = (2)^2$$

$$(x-11)^2 + (y+2)^2 = 36$$

Center: (11, -2)
radius: 6

$$6. x^2 + y^2 - 16x - 6y + 48 = 0$$

$$x^2 - 16x + \frac{64}{4} + y^2 - 6y + \frac{9}{4} = -48 + \frac{64}{4} + \frac{9}{4}$$
$$-\frac{16}{2} = (-8)^2 \quad -\frac{6}{2} = (-3)^2$$

$$(x-8)^2 + (y-3)^2 = 25$$

Center: (8, 3)
radius: 5

$$7. x^2 + y^2 - 16x - 14y + 77 = 0$$

$$x^2 - 16x + \frac{64}{4} + y^2 - 14y + \frac{49}{4} = -77 + \frac{64}{4} + \frac{49}{4}$$
$$-\frac{16}{2} = (-8)^2 \quad -\frac{14}{2} = (-7)^2$$

$$(x-8)^2 + (y-7)^2 = 36$$

Center: (8, 7)
radius: 6

$$8. x^2 + y^2 + 12x - 14y - 15 = 0$$

$$x^2 + 12x + \frac{36}{4} + y^2 - 14y + \frac{49}{4} = 15 + \frac{36}{4} + \frac{49}{4}$$
$$\frac{12}{2} = (6)^2 \quad -\frac{14}{2} = (-7)^2$$

$$(x+6)^2 + (y-7)^2 = 100$$

Center: (-6, 7)
radius: 10

Answers to Converting General Form to Standard Form Skills Practice:

1. $(x+3)^2 + (y-3)^2 = 49$

2. $(x+1)^2 + (y+5)^2 = 36$

3. $(x+8)^2 + (y-7)^2 = 16$

4. $(x+10)^2 + (y+6)^2 = 16$

5. $(x-11)^2 + (y+2)^2 = 36$

6. $(x-8)^2 + (y-3)^2 = 25$

7. $(x-8)^2 + (y-7)^2 = 36$

8. $(x+6)^2 + (y-7)^2 = 100$