

Math 116
Homework 02

Blake Farman
University of South Carolina

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2.1

1. Complete the square for the following expressions:

(a) $f(x) = x^2 - 6x + 15$

(b) $h(y) = y^2 + 5y$

(c) $g(s) = s^2 + 2s - 8$

(d) $k(x) = 2x^2 - 2x + 5$

(e) $f(x) = 3x^2 - 7x + 1$

(f) $w(x) = \pi x^2 + 2x$

2. Complete the square for the following expressions:

(a) $f(x) = x^2 - 8x + 12$

(b) $h(y) = y^2 + 14y$

(c) $g(x) = s^2 + 3s - 6$

(d) $k(x) = 4x^2 - 8x + 3$

5. Complete the square in both x and y for the following equations:

(a) $x^2 + 3x + 2y^2 - 8y = 0$

(b) $3x^2 + 6x - 2y^2 - 8y = -11$

(c) $-x^2 + 4x + y^2 - 16y = 40$

(d) $-9x^2 + 36x - 4y^2 - 8y = 0$

(e) $x^2 + y^2 - 6x + 10y + 34 = 0$

The graph of this last example is called a **degenerate circle**. (Can you figure out why?)

7. Find the center and radius of the circles represented by the following equations:

(a) $x^2 + y^2 - 4x - 2y = 11$

(b) $x^2 + y^2 - 6x + 4y - \pi^2 + 13 = 0$

(c) $2x^2 + 2y^2 + 4x + 8y - 20 = 0$

8. Find the center and radius of the circles represented by the following equations:

(a) $x^2 + y^2 - 6x - 8y = 0$

(b) $x^2 + y^2 - 10x + 12y + 12 = 0$