

## Circles

Rewrite the following equations in Center form, identify the center and the radius.

Ex.  $x^2 + y^2 + 6x - 8y - 11 = 0$   
 $x^2 + 6x + y^2 - 8y - 11 = 0$   
 $x^2 + 6x + \underline{\quad} + y^2 - 8y + \underline{\quad} = 11 + \underline{\quad} + \underline{\quad}$   
 $\quad\quad\quad 3 \quad\quad\quad -4$   
 $x^2 + 6x + 9 + y^2 - 8y + 16 = 11 + 9 + 16$   
 $(x+3)^2 + (y-4)^2 = 36$

Rewrite

$\frac{1}{2}$  and square, add both sides

Center  $(-3, 4)$ , radius = 6

1.  $x^2 + y^2 - 4x + 6y - 9 = 0$

2.  $x^2 + y^2 + 6x - 4y + 4 = 0$

3.  $x^2 + y^2 - 2x + 8y + 16 = 0$

4.  $x^2 + y^2 + 4x - 6y + 9 = 0$

5.  $x^2 + y^2 - 8x + 2y + 16 = 0$

6.  $x^2 + y^2 + 2x + 4y + 4 = 0$

7.  $x^2 + y^2 + 4x - 8y + 25 = 0$

8.  $x^2 + y^2 - 6x - 4y + 4 = 0$

9.  $x^2 + y^2 - 4x - 2y + 1 = 0$

10.  $x^2 + y^2 - 8x - 6y + 9 = 0$