1. Complete the square for the following expressions.

   (a) $x^2 - 6x + 15$ $(x-3)^2 + 6$

   (b) $x^2 + 2x - 8$ $(x+1)^2 - 9$

   (c) $4x^2 - 8x + 3$ $4(x-1)^2 - 1$

2. Complete the square for the following equations. (Bonus: Solve the equations.)

   (a) $x^2 - 8x + 12 = 0$ $(x-4)^2 = 4$ Solutions: $x = 2$ or $x = 6$

   (b) $x^2 + 3x - 6 = 0$ $\left(x + \frac{3}{2}\right)^2 = \frac{33}{4}$ Solutions: $x = -\frac{3}{2} \pm \frac{\sqrt{33}}{2}$

   (c) $-3x^2 - 6x + 15 = 0$ $(x+1)^2 = 6$ Solutions: $x = -1 \pm \sqrt{6}$

3. Find the center and radius of the circles represented by the following equations.
   Hint: Use the method of completing the square to rewrite the equation in the form

   $$(x-h)^2 + (y-k)^2 = r^2$$

   where (h, k) is the center and r is the radius.

   (a) $x^2 + y^2 - 6x - 8y = 0$
   $(x-3)^2 + (y-4)^2 = 5^2$ center: $(3, 4)$, radius: 5

   (b) $x^2 + y^2 - 4x - 2y = 11$
   $(x-2)^2 + (y-1)^2 = 4^2$ center: $(2, 1)$, radius: 4

   (c) $2x^2 + 2y^2 + 4x + 8y - 20 = 0$
   $(x+1)^2 + (y+2)^2 = \sqrt{15}^2$ center: $(-1, -2)$, radius: $\sqrt{15}$