7.1 Quadratic Functions

**Quadratic Functions (in general form)**
- a function where a, b, and c are real numbers with $a \neq 0$, in the form
  \[ y = ax^2 + bx + c \]

**Quadratic Function: Standard Form (or "vertex form")**
- standard form is easiest to use when graphing
  \[ y = a(x - h)^2 + k \quad \text{or} \quad f(x) = a(x - h)^2 + k \]

-to get from general (abc) to Standard (vertex) form, you will often need to...
  complete the square
Completing the Square

\[ y = x^2 - 10x + 32 \]
\[ y = x^2 - 10x + 25 + 32 - 25 \]
\[ y = (x - 5)^2 + 7 \]

\[ y = 3x^2 - 12x + 1 \]
\[ y = 3x^2 - 12x + 4 - 12 + 1 \]
\[ y = 3(x^2 - 4x + 4) - 11 \]
\[ y = 3(x - 2)^2 - 11 \]

Completing the Square

\[ y = -5x^2 - 110x - 533 \]
\[ y = -5 \left( x^2 + 22x + 121 \right) + 605 - 533 \]
\[ y = -5(x + 11)^2 + 72 \]

\[ y = 4x^2 - \frac{8}{3}x + 2\frac{5}{9} \]
\[ y = 4 \left( x^2 - \frac{2}{3}x + \frac{1}{9} \right) - \frac{4}{9} + \frac{25}{9} \]
\[ y = 4 \left( x - \frac{1}{3} \right)^2 + 2\frac{5}{9} \]
\[ y = 4 \left( x - \frac{1}{3} \right)^2 + 2\frac{1}{3} \]
Example 1: Write \( y = 2x^2 + 8x + 7 \) in standard form.

Assignment (Due "TBD")

1) Read all parts of 7.1

2) Chapter 7 Problems Packet
   a) 7.1 - simply get into "vertex form"
      by completing the square

   *) Looking for:
      neat, complete, organized, and well labeled

3) Progress Report