

### 3.3. Completing the Square

**Completing the square** is an algebraic process that converts a function from quadratic form to vertex form.

**Example 1: Write the following in vertex form:**

a.)  $f(x) = x^2 + 6x + 5$

b.)  $f(x) = 3x^2 - 12x - 9$

c.)  $f(x) = -5x^2 - 70x$

Try:

a.)  $f(x) = x^2 + 8x - 7$

b.)  $f(x) = 2x^2 - 20x$

**Example 2: Modeling a real life problem**

a.) A farmer has 100 m of fencing available to build an enclosure for his cows. The enclosure only requires 3 sides of fencing, as the 4<sup>th</sup> side is against the barn. Determine the dimensions of the enclosure that maximizes the area of the enclosure.

b.) A school dance charges \$10 for an entrance fee for 300 students. They predict that if they decreased the price by \$1, they would get 10 more students. What is the optimal price to charge?