Math 31                          Activity # 4

“Solving Quadratic Equation by Completing the Square”

Your Name: ___________________

A. Completing the Perfect Square

Perfect square binomials are: (Fill in the table below)

\[(A+B)^2 = \]

\[(A-B)^2 = \]

Use the above identities to complete the squares.

\[x^2 + bx + \square = ( \square )^2\]

\[x^2 - bx + \square = ( \square )^2\]

In your own words write the rule for writing \(x^2 + bx\) as a perfect square

Write the rule for completing the square:

Use the rule to complete the following squares.
B. Solving equations using the square root property.

Write the square root property in the box below.

If \( x^2 = a \), then \( x = \sqrt{a} \) or \( x = -\sqrt{a} \)

Solve the following equations using the square root property.

1) \( x^2 = 81 \)  
2) \( (x + 6)^2 = 7 \)

3) \( 49x^2 - 3 = 0 \)

C. Solving Quadratic Equations by Completing the square
Ex: Follow the following steps to solve \( 3x^2 - 24x - 27 = 0 \) by completing square.

1. Write the equation in the form: \( Ax^2 + Bx = C \).

2. Divide both sides by \( A \) so you have an equation of the form \( x^2 + dx = k \).

3. Use the following two steps to write one side as a perfect square and the other side as a simplified number.

\[
x^2 + dx + \square = k + \square
\]

\((\square)^2 = \square\)

4. Use square root property to solve the equation.

Solve each quadratic equation by completing the square.
Only to be used for arranged hours

1) \( x^2 - 6x + 2 = 0 \)  \hspace{1cm} 2) \( x^2 + 2x + 5 = 0 \)

3) \( 4x^2 - 24x + 27 = 0 \)  \hspace{1cm} 4) \( (x + 4)(x - 1) = -6 \)

5) \( 3x^2 - 2x - 4 = 0 \)  \hspace{1cm} 6) \( \frac{x^2}{6} + \frac{x}{3} - 1 = 0 \)

7) \( x^2 + 4bx = 5b^2 \)