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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.

$$x^2 + bx + \boxed{} = ()^2$$

$$x^2 - bx + \boxed{} = ()^2$$

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.

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a) $x^2 - 12x + \boxed{} = ()^2$

b) $x^2 + 5x + \boxed{} = ()^2$

c) $x^2 + \frac{1}{2}x + \boxed{} = ()^2$

B. Solving equations using the square root property.

Write the square root property in the box below.

If $x^2 = a$, then $x = $ or $x = $

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

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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.

$$x^2 + dx + \boxed{} = k + \boxed{}$$

$$()^2 = \boxed{}$$

4. Use square root property to solve the equation.

Solve each quadratic equation by completing the square.

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1) $x^2 - 6x + 2 = 0$

2) $x^2 + 2x + 5 = 0$

3) $4x^2 - 24x + 27 = 0$

4) $(x + 4)(x - 1) = -6$

5) $3x^2 - 2x - 4 = 0$

6) $\frac{x^2}{6} + \frac{x}{3} - 1 = 0$

7) $x^2 + 4bx = 5b^2$