Name:_____   Date:_____

UNIT 9   **LESSON 4**

Do Now:

   a. If one root of the equation $x^2 + kx - 15 = 0$ is -3, what is the other root?

   b. Using your calculator, find the axis of symmetry and the turning point of $f(x) = x^2 + 4x - 21$.

AIM: FINDING THE AXIS OF SYMMETRY AND TURNING POINT ALGEBRAICALLY

Other words for turning point: _____

Directions: Find the turning point *algebraically*.

1. $g(x) = x^2 + 4x - 21$

> Step 1: Identify the a-value & b-value
>
> Step 2: Use the axis of symmetry formula:
> $$x = \frac{-b}{2a}$$
>
> Step 3: Plug the x-value into the given equation to find the y-value.
> $$y = ax^2 + bx + c$$
>
> Step 4: Write your answer as coordinates.
>
> Step 5: Check your answer with the table/graph on the calculator

2. Find the vertex _algebraically_. $h(x) = -x^2 - 10x + 24$

Step 1: Identify the a-value & b-value
Step 2: Use the axis of symmetry formula: $$x = \frac{-b}{2a}$$
Step 3: Plug the x-value into the given equation to find the y-value. $y = ax^2 + bx + c$
Step 4: Write your answer as coordinates.
Step 5: Check your answer with the table/graph on the calculator

3. Find the minimum point algebraically: $a(x) = x^2 + 6x - 27$

Step 1: Identify the a-value & b-value
Step 2: Use the axis of symmetry formula: $$x = \frac{-b}{2a}$$
Step 3: Plug the x-value into the given equation to find the y-value. $y = ax^2 + bx + c$
Step 4: Write your answer as coordinates.
Step 5: Check your answer with the table/graph on the calculator

4. Find the vertex algebraically: $b(x) = x^2 + 8x + 16$

Step 1: Identify the a-value & b-value

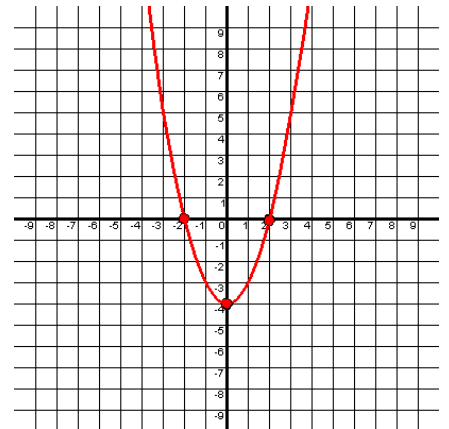Step 2: Use the axis of symmetry formula:
$$x = \frac{-b}{2a}$$

Step 3: Plug the x-value into the given equation to find the y-value.
$y = ax^2 + bx + c$

Step 4: Write your answer as coordinates.

Step 5: Check your answer with the table/graph on the calculator

5) Write the quadratic equation given the graph below.

6) If -1 and 7 are the roots of the quadratic equation $x^2 + kx - 7 = 0$, find the value of k.