BECA / Huson / 11.1 IB Math SL Name:
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Solving Quadratic Functions

by factoring or completing the square

Solve for the roots or zeros of the function

For each function, first factor it (always show this step), then state the roots using the form, "$x = 3, 4$ (or whatever the values are).

1. $f(x) = x^2 + 7x + 12$

2. $f(x) = x^2 + 13x + 12$

3. $f(x) = x^2 - 4x - 12$

4. $f(x) = 2x^2 - 10x - 12$

5. $f(x) = -3x^2 + 6x - 3$

6. $f(x) = \frac{1}{2}x^2 + 2x + 2$

Completing the square

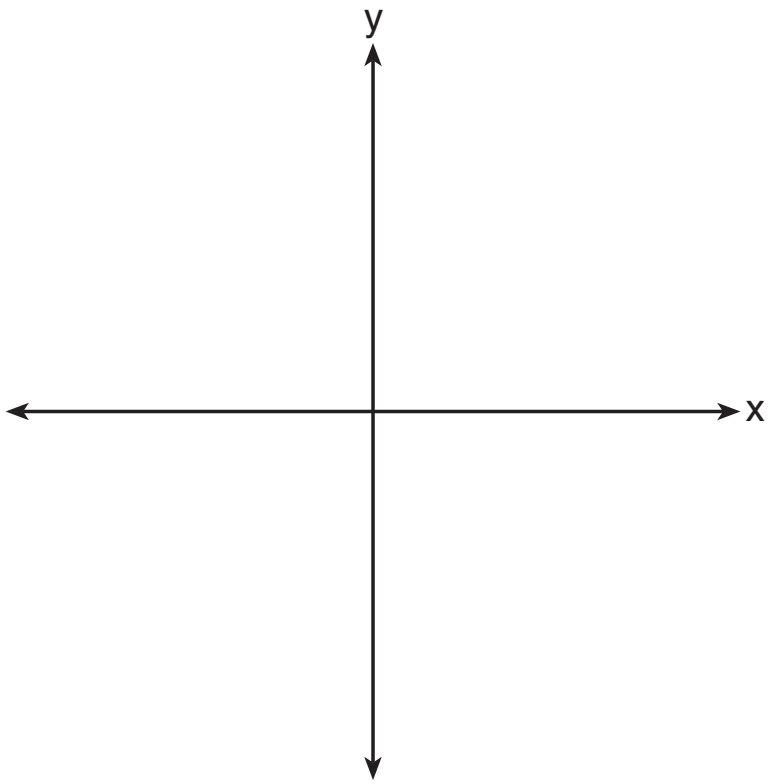
Rewrite the function in vertex form, $f(x) = (x - h)^2 + k$. Include the step showing the $(-\frac{b}{2a})^2$ term.

7. $f(x) = x^2 - 6x + 11$

8. $f(x) = x^2 + 8x + 9$

Expand from vertex form to standard form, $ax^2 + bx + c$ where $a, b, c \quad \epsilon R$. Then factor the result and state the roots. Sketch the function, labeling the intercepts' values, and vertex as an ordered pair.

9. $f(x) = (x - 2)^2 - 9$



Model situations with quadratic functions

Use a graphing calculator to view the graph and a table of values for the following function:

$$h(x) = -\frac{1}{225}x^2 - \frac{2}{3}x$$

where $h(x)$ represents the height of an object and x it's horizontal position.

Make a table of values to the left of the graph, below. Include key values. Graph the function over domain where $h(x) > 0$. Use a horizontal scale of 1 square equals 10 units and vertical scale of 1 square equals 2.5 units. Label the intercepts and vertex.