

Part 2 of Unit 2

Recall: The graph of a quadratic function is parabola.

You should be able to find the vertex of a parabola using technology and use it to solve problems.

You should be able to find the x-intercepts of a parabola using ✕

- technology
- factoring -
 - a) Removing a Common Factor 10
 - b) Difference of Two Squares 10
 - c) Trinomials of the form $x^2 + bx + c$ 10
 - d) Trinomials of the form $ax^2 + bx + c$ new
using Decomposition
- Quadratic Formula new

Once you have found the x-intercepts of a parabola, you should be able to use them to solve problems.

Section 2.5: Finding the x-intercepts of a Quadratic Function Using Technology and Using them to Solve Problems

Terminology

Quadratic function $y = ax^2 + bx + c$.

(y =)

The graph of a quadratic function is a parabola.

- Graph functions

Quadratic Equation (= 0)

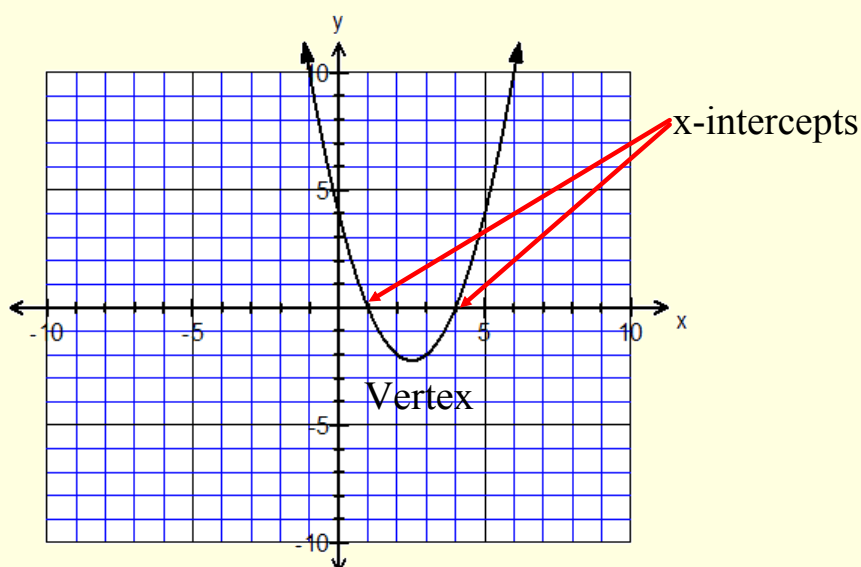
$$0 = ax^2 + bx + c \quad \text{or} \quad ax^2 + bx + c = 0$$

- Solve equations

x-intercepts -the point where a graph crosses the x-axis. (function)

Roots or zeros - are the value(s) of x that make a quadratic equation equal to zero.

The roots or zeros of a quadratic equation are equal to the x-intercepts of the quadratic function. So often the terms are used interchangeably.



The **x-intercepts** are 1 and 4.

The **coordinates of the x-intercepts** are (1, 0) and (4, 0).

Finding the x-intercepts using your calculator

Type the function into your calculator. Go to **y =**

Then **graph** the function. If you do not get a graph go to **2nd y =** and press **4:Plots Off** then **Enter**. Now **graph** again. (You may need to press **zoom 6:Standard** to get back to a simple x-y plane.)

To find the x-intercepts

press **2nd TRACE** (Calc)

go to **2: Zero, Enter**

(move the cursor to the left and right of the x-intercept pressing enter after each move.)

Then Press **Enter**. This will give you the co-ordinates of the first x-intercept.

Repeat for the second x-intercept.

Examples:

- Use your calculator to find the vertex and x-intercepts of each quadratic function.

A) $y = 2x^2 - 12x + 16$

Vertex (3, -2)

x intercepts are 2 and 4.

coordinates of X-intercepts
(2, 0) and (4, 0)

B) $y = x^2 - 6x - 16$

Vertex (3, -25)

x-intercepts are
-2 and 8

C) $y = -x^2 - 4x + 12$

D) $y = 0.05x^2 - x$