

Section 2.3: Quadratic Functions

A parabola is a second degree polynomial that can be written in one of the following forms.

Form 1:

Form 2:

Example 1: Find the indicated information for the parabola and then sketch a rough graph.

A) $y = 2(x - 4)^2 + 7$

Vertex:

opens:

range:

B) $y = -3(x + 200)^2 - 71$

vertex:

opens:

max value:

min value:

Example 2: Find the vertex and determine if the parabola crosses the x-axis. If it does, find these values of x .

$$y = x^2 - 7x + 12$$

Example 3: The price-demand function for a product is given by $p = 1400 - 60x$ where the units of x are in thousand items and the units of p are in dollars per thousand items. The cost, in dollars, is given by $C(x) = 2000 + 500x$.

Find the number of items that would maximize profit.

What is the price per thousand items when profit is maximized?

Find the break even values.

Between what production levels will the company have a profit?

Example 4: The table shows the cost(in dollars) per item to produce x hundred items.

x	2	6	9	14	16
cost/item	992	528	348	368	488

Find a formula that will model this information.

For what number of items is the cost per item the smallest?