

Coreq Support for Section 4.2

Topic 1: Determining if the Graph of a Quadratic Function Opens Up or Down

For a quadratic function of the form $f(x) = a(x - h)^2 + k$, the value of a determines the direction that the parabola opens.

If $a > 0$, the parabola opens up and has a minimum value at the vertex. If $a < 0$, the parabola opens down and has a maximum value at the vertex.

Topic 2: Determining Relative Maximum and Relative Minimum Values of a Function

In section 3.2, we learned how to identify relative maximum and minimum values of a function when given its graph.

When a function changes from increasing to decreasing at a point $(c, f(c))$, then f is said to have a relative maximum at $x = c$. The relative maximum value is $f(c)$.

When a function changes from decreasing to increasing at a point $(c, f(c))$, then f is said to have a relative minimum at $x = c$. The relative minimum value is $f(c)$.

Topic 3: Writing Revenue and Profit Functions

Revenue is defined as the dollar amount received by selling x items at a price of p dollars per item, that is, $R = xp$.

The Law of Supply and Demand states that as the quantity x increases, the price p tends to decrease. Likewise, if the quantity decreases, the price tends to increase. Thus, the price p is often modeled with a linear function that is called the demand function.

Profit is equal to revenue minus cost. We can say that $P(x) = R(x) - C(x)$ where x represents the quantity of an item.