

## Profit Models

Quadratics are commonly used as profit models.

The basic idea behind this is that when you first start a business, as your sales increase your profits increase at a rapid rate.

However, you eventually hit a point where you can no longer meet demand. At this point you need to hire more employees, invest in real estate or other capital projects. When you get here, your profits decrease.

When we discuss profit models we have

A Cost Function:	$C(x)$
A Demand Function:	$p(x)$
The number of units sold:	$(x)$
The Revenue Function:	$[p(x)](x)$
A Profit Function:	$Revenue - Cost$
	$[p(x)](x) - C(x)$

### Example

The demand function for a new magazine is  $p(x) = -6x + 40$ , where  $p(x)$  represents the selling price, in thousands of dollars, of the magazine and  $x$  is the number sold, in thousands.

The cost function is  $C(x) = 4x + 48$ . Calculate the maximum profit and the number of magazines sold that will produce the maximum profit.