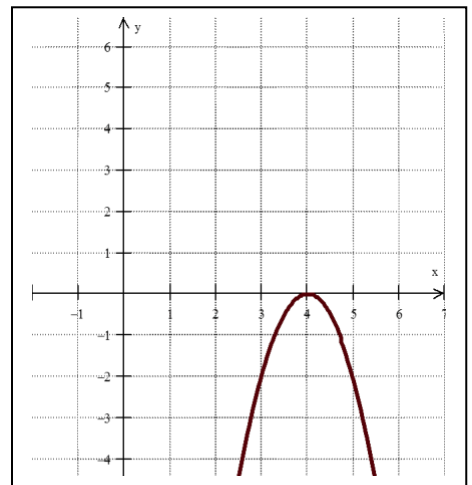
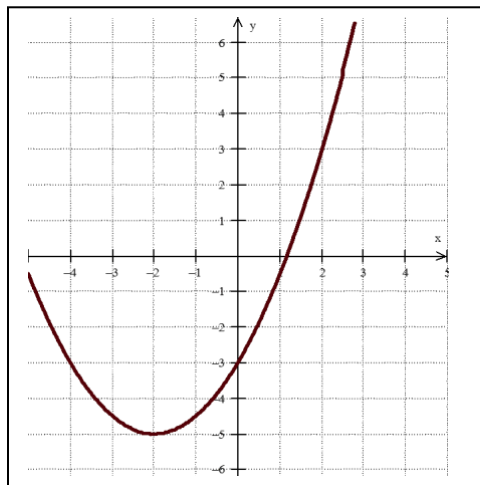
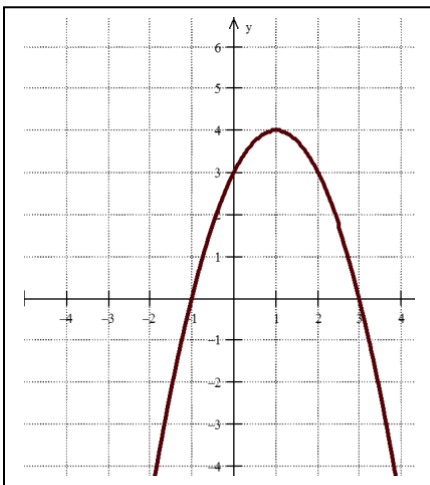


Maximum or Minimum Values **NOTE: Extra Paper Required for this note.*****

Consider the following graphs.

Is the optimal Value a Maximum or a minimum? Why?



Indicate the maximum or minimum.

When does the optimal value occur?

Determine the maximum or minimum value for each of the following quadratics **and** state the value of x for which this occurs.

The Domain of each is $D: \{x \in \mathbb{R}\}$. State the Range of each. You will need separate paper.

1. By Factoring.

a) $y = -x^2 + 2x + 48$

b) $y = 3x^2 + 11x - 4$

2. By Partial Factoring.

a) $f(x) = 2x^2 - 8x + 5$

b) $y = 1 - 4x^2 - 8x$

3. By Completing the Square

a) $g(x) = -x - 2x^2$ b) $y = 3x^2 - 5x + 4$ c) $h(x) = x^2 - 0.06x + 0.4$

Maximum and Minimum Word Problems

- A football is kicked straight up in the air. Its height above the ground is approximated by the relation $h(t) = 24t - 5t^2$, where h is the height in metres and t is the time in seconds. What maximum height will the ball reach? How long does it take to reach the maximum height?
- Raven and Ben are knitting scarves to sell at the craft show. The wool for each scarf costs \$6. They were planning to sell the scarves for \$10 each, the same as last year when they sold 40 scarves. However, they know that if they raise the price, they will be able to make more profit, even if they end up selling fewer scarves. They have been told that for every 50¢ increase in price, they can expect to sell four fewer scarves. What selling price will maximize their profit and what will the profit be?