Chapter 5 Section 5 MA1032 Data, Functions & Graphs

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Vertex Form of a Quadratic

$$y = f(x) = a(x-h)^2 + k$$

Example

$$y = -3(x+4)^2 - 7$$

Standard Form to Vertex Form

Example

$$y = x^2 - 10x + 25$$

Example

$$h(x) = -2x^2 - 8x - 8$$

Quadratic Formula Connections

$$y = f(x) = ax^{2} + bx + c$$
$$y = f(x) = a\left(x + \frac{b}{2a}\right)^{2} + \left(c - \frac{b^{2}}{4a}\right)$$

Exercise #28

A football player kicks a ball at an angle of 37° above the ground with an initial speed of 20 meters per second. The height, *h*, as a function of the horizontal distance traveled, *d*, is given by

$$h(d) = 0.75d - 0.0192d^2.$$

- Graph the path the ball follows without using the grapher on your calculator.
- When the ball hits the ground, how far is it from the spot where the football player kicked it?
- What is the maximum height the ball reaches during its flight?
- What is the horizontal distance the ball has traveled when it reaches its maximum height?



- Vertex Form
- ② Graphing without a calculator
- Quadratic Formula