

8.3 Graphing Quadratics (STUnotes).notebook

Using graphing calculator

Determine if the function has a maximum or minimum. Then find the vertex for each.

1. $f(x) = 2(x + 2)(x - 2)$

2. $g(x) = (x + 2)(x - 3)$

Graph the function. Find the vertex, zeros and y-intercept of each.

1. $y = -2(x - 4)(x + 1)$

2. $h(x) = 4(x - 3)(x + 3)$

Graph each function. Find the vertex, roots, and y-intercept. Then determine the domain and range.

1. $h(x) = -(x+1)^2 - 4$

2. $f(x) = 3(x+2)^2 + 1$

The average height h in centimeters of a certain type of grain can be modeled by the function $h(r) = 0.024r^2 - 1.28r + 33.6$, where r is the distance in centimeters between the rows in which the grain is planted. Based on this model, what is the minimum average height of the grain, and what is the row spacing that results in this height?

r = distance between rows (in cm)

$h(r)$ = average height (in cm)

put into calculator

vertex is a min at $(26.67, 16.53)$

Minimum is 16.53_{cm}

→ row spacing resulting in that height is 26.67_{cm}

The highway mileage m in miles per gallon for a compact car is approximated by $m(s) = -0.025s^2 + 2.45s - 30$, where s is the speed in miles per hour. What is the maximum mileage for this compact car to the nearest tenth of a mile per gallon? What speed results in this mileage?

$$m(s) = \text{highway mileage (in mpg)}$$

$$s = \text{speed (mph)}$$

$$\text{Vertex } (49, 30.025)$$

$$\text{Max-mileage is } 30.025 \text{ mpg}$$

$$\text{Speed is } 49 \text{ mph}$$

Suppose the height of a water-rocket, in feet, can be modeled by the function $h(t) = -16t^2 + 78t + 4$, where t , is the time, in seconds, since the rocket has been launched. Determine the maximum height the rocket will reach.

A ball is thrown vertically upward. After t seconds, its height h (in feet) is given by the function $h(t) = 64t - 16t^2$.

$$h(t) = \text{height in feet}$$

$$t = \text{time in seconds}$$

a) After how long will it reach its maximum height? (2.64)

It will reach max height after 2 sec

b) How long is the ball in the air?

$$(4, 0) \quad 4 \text{ sec.}$$

c) How high is the ball after 1 second?

$$48 \text{ feet}$$

The ball is 48 feet in the air after 1 second.

A person throws a ball up from a height of 6 feet with an initial velocity of 48 feet per second.

a) Write a polynomial that represents the height of the ball after t seconds.

b) What is the maximum height of the ball?

c) How long does it take for the ball to reach its maximum height?

d) How long is the ball in the air?

★ HW - PC Review
PC is Friday