Key

Quadratic Word Problems

1. A ball is thrown vertically upward from the top of a building with an initial speed of 80 feet per second. The height *h(t)* above the starting point in feet after *t* seconds is given by the equation $h(t) = -16t^2 + 80t + 20$. What is the maximum height reached by the ball?

maximum height 120

window $x \to -1, 15$ scl 1

$y \to -1, 200$ scl 20

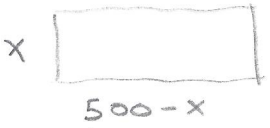
2. A shot-put throw can be modeled using the equation $f(x) = -0.0241x^2 + x + 5.5$, where *x* is distance traveled in feet and *f(x)* is the height, also in feet. How long was the throw?

y height in feet

x = distance

46.41 ft.

3. A farmer has 1000 feet of fencing and a very big field. She can enclose a rectangular area with dimensions *x* ft and 500 – *x* ft. What is the largest rectangular area she can create?



$x(500 - x) = A$

$500x - x^2 = A$

$X = 250$ $Y = 62,500$

4. The value of Jennifer's stock portfolio is given by the function $v(t) = 50 + 73t - 3t^2$, where v(t) is the value of the portfolio in hundreds of dollars and t is the time in months. How much money did Jennifer start with? (1) When ~~with~~ the value of Jennifer's portfolio be at a maximum? (2)

value

time

↳ 12.17 months

↳ find where X=0

look @ table

Y = 500

5. A high school football player is practicing his field goal kicks. The equation $h(t) = -9t^2 + 45t$ represents the height of the ball at a specific time. Where is the ball at 4 seconds? If the ball is 54 feet in the air, how much time has gone by?

(1) t (2) f(t)

(1) X = 4, Y = 36 ft

look in table or use 2nd trace value

(2) 2 seconds & 3 seconds

6. Sara and Marisol are kicking a soccer ball back and forth to each other. The equation $h(t) = -4t^2 + 24t$ represents the height of the ball at a specific time where t is the amount of time and h(t) is the height in feet. How long does it take the ball to come back to the ground? What is the highest point the ball will go?

(1) t

X = 6

Y = 0

so 6 seconds.

Look @ table to see where Y = 0 or use 2nd trace zero

(2) h(t)

max = , Y = 36

so 36

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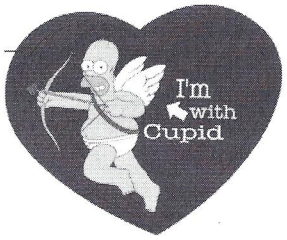

In honor of my Least favorite impending holiday...

Cupid shoots an arrow intending to hit Cassandra. The height of the arrow is modeled by the function $h(t) = -16t^2 + 28t + 3$, where t is time in seconds since the arrow was launched.

a.) What is the maximum height of Cupid's arrow?

15.25

b.) How high will the arrow be after 0.5 seconds

13 ft

c.) If Cassandra is 5 feet tall and the arrow hits her on its downward arc, how long until she gets hit with the arrow?

so where is $h(t) = 5$ on the right side of the max?

$x = 1.675$ seconds

d.) If Cupid misses, when with the arrow hit the ground?

$x = 1.8512$ use second trace zero

e.) If the arrow does hit Cassandra, how many years will he spend in jail for felony assault?

At least 20 if Ms. Davis is on the jury!