

Jan. 25, 2017

Sect. 3-4

Quadratic Applications

Max/Min

Word Problems

Find the max/min value (Vertex)


Depends on which way parabola opens. (a)

$$f(x) = -2x^2 + 8x - 9$$

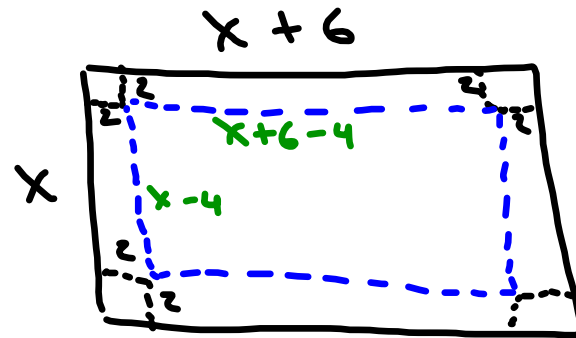
$$h = \frac{-b}{2a} = \frac{-8}{2(-2)} = \frac{-8}{-4} = 2$$

$$k = -2(2)^2 + 8(2) - 9 = 5$$

$$V: (2, 5)$$

Parabola opens down
so vertex is max 
 $f(x)$ has a max value
of 5. It happens
when $x = 2$

A box is made by cutting 2 inch squares from a flat sheet of cardboard. The flat sheet is 6 inches longer than it is wide. Find the dimensions if the volume needs to be 224 cu.in. (in^3)



$$(x-4)(x+2)(2) = 224$$

$$x^2 - 2x - 8 = 112$$

$$x^2 - 2x - 120 = 0$$

$$(x+10)(x-12) = 0$$

$$x = \cancel{-10} \quad x = 12$$

neg. length?

So flat sheet is 12 x 18 in.

Projectile Motion

$$s(t) = -16t^2 + v_0 t + h_0 \quad (\text{in feet})$$

v_0 is initial velocity, h_0 is initial height

Baseball hit $v_0 = 80 \frac{\text{ft}}{\text{sec}}$ $h_0 = 3 \text{ ft.}$

What is the max height of ball?

When does it happen?

$$s(t) = -16t^2 + 80t + 3$$

So the ball
reaches a max
height of 103 ft.

$2\frac{1}{2}$ sec. after 'it is hit.

