November 3, 2023

Quadratic Applications

Pom Pons

$20 Sell 50

↑ $2 Sell 3 less

Maximize Revenue

Find vertex

Rev = (# sold)(price)

$R = (50-3x)(20+2x)$

$50-3x=0$ $\quad 20+2x=0$

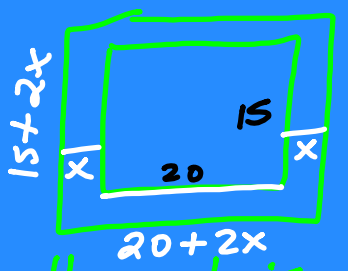
$50=3x$ $\quad 2x=-20$

$\frac{50}{3}=x$ $\quad x=-10$

Vertex: $x=\frac{\frac{50}{3}+-10}{2}$

y: plug in

Strip



How wide is strip?

Solve for x.

$l \cdot w = \text{Area}$

$(20+2x)(15+2x) = \text{Total Area}$

Solve for x

1) FOIL
2) Set = 0
3) Solve by factoring or quadr. formula

Projectile Motion

$h(t) = \frac{1}{2}at^2 + v_0t + s_0$

How high will it go?

Find vertex

$t = \frac{-b}{2a}$

h = plug in time

How long until it reaches a certain height

1) Set = to height
2) Move to = 0
3) quadr. formula

7) Maximize Profit

Profit = Revenue − Cost

↑ distribute