Warmup (Quiz Friday on 2.2-2.4)

① What is the maximum product of two numbers that add to give 22. What are the numbers?

① variables/equations

$x + y = 22 \Rightarrow y = 22 - x$

$x, y \Rightarrow$ 2 numbers

$P = x \cdot y$

Quadratic ⇒ vertex

$P = x(22 - x)$

$P = 22x - x^2 = ax^2 + bx + c$

$h = \frac{-b}{2a} = \frac{-22}{2(-1)} = 11$

max product has $x = 11$

$y = 22 - x$

$= 22 - 11$

$y = 11$

11 and 11

Product 121

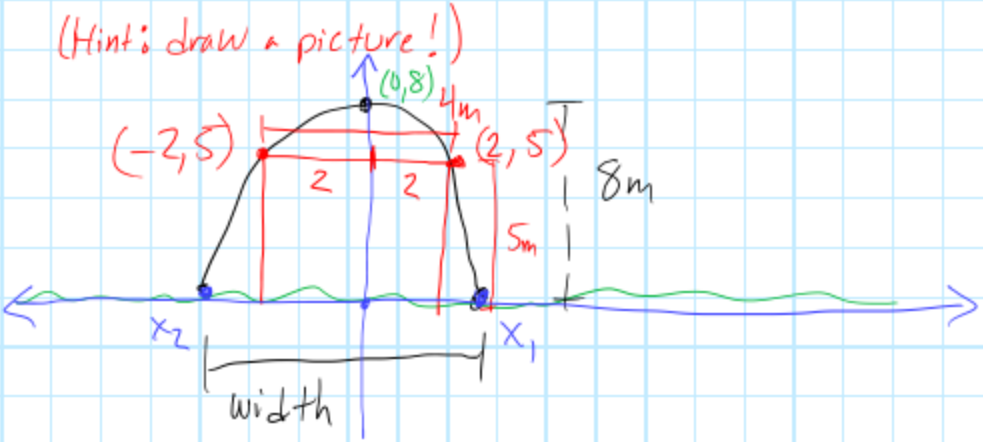
$k = \underset{\text{at max}}{\text{Product}} = 22(11) - (11)^2$

$= 242 - 121$

$= 121$

(2) A parabolic arch is 8 m tall. If a rectangular truck that is 5m tall and 4m wide must fit through the arch, how wide must the arch be at the bottom? (Answer exactly and to 1 decimal place)

(Hint: draw a picture!)



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

$h=0$ $k=8$

$$y = ax^2 + 8$$

point $(2,5)$

$$f(2) = 5 = a(2)^2 + 8$$

$$5 = 4a + 8$$

$$-3 = 4a \Rightarrow a = -\frac{3}{4}$$

$$f(x) = -\frac{3}{4}x^2 + 8 = 0$$

$$-\frac{4}{3} \cdot -\frac{3}{4}x^2 = -8 \cdot -\frac{4}{3}$$

$$x^2 = \frac{32}{3}$$

$$x = \pm\sqrt{\frac{32}{3}}$$

$$\text{width} = \sqrt{\frac{32}{3}} + \sqrt{\frac{32}{3}}$$

$$= 2\sqrt{\frac{32}{3}}$$

$$= 6.5 \text{ m}$$

Schedule

Fri Nov 1 – Quiz 2.2 – 2.4 $\quad h = \frac{-b}{2a}$

(Completing the Square)

Tu Nov 5 – Collab – Give back Quiz

Th Nov 7 – Math Contest / Remembrance Assemblies

(Review if possible)

Wed Nov 13 – chp 2 test (Block flip)