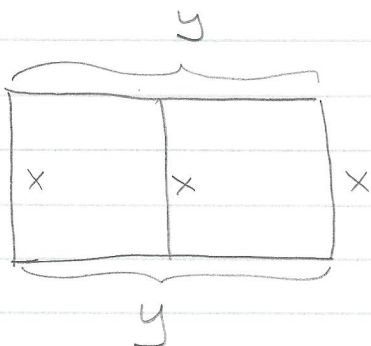


MAC 2311
Hw Quiz

Section 4.7

#13, 35

13



total
maximize the perimeter
fencing

$$P = 3x + 2y$$

$$A = xy = 1,500,000$$

$$y = \frac{1,500,000}{x}$$

$$P = 3x + 2y = 3x + 2\left(\frac{1,500,000}{x}\right) = 3x + 3,000,000x^{-1}$$

$$P' = 3 - 3,000,000x^{-2} = 3 - \frac{3,000,000}{x^2} = \frac{3x^2 - 3,000,000}{x^2}$$

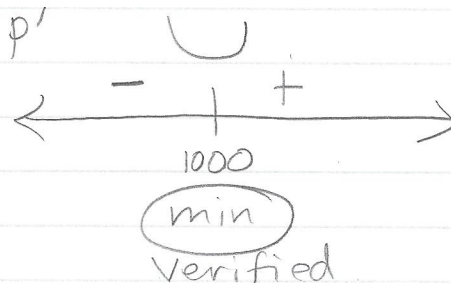
$$P' = 0$$

$$3x^2 - 3,000,000 = 0$$

$$3x^2 = 3,000,000$$

$$x^2 = 1,000,000$$

$$x = 1000 \text{ ft}$$

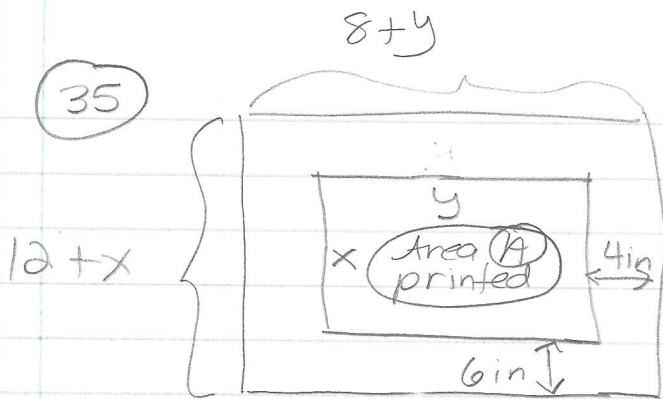


$$P'(999) = -$$

$$P'(1001) = +$$

$$y = \frac{1,500,000}{1000} = 1500 \text{ ft}$$

Dimensions = 1000 ft x 1500 ft



$$A = xy = 384 \quad (x)$$

$$y = \frac{384}{x}$$

$$\text{Area of poster} = (8+y)(12+x)$$

minimize Area of poster

$$A = 96 + 8x + 12y + xy$$

$$A = 96 + 8x + 12\left(\frac{384}{x}\right) + x\left(\frac{384}{x}\right)$$

$$A = 480 + 8x + 4608x^{-1}$$

$$A' = 8 - 4608x^{-2}$$

$$A' = \frac{8 - 4608}{x^2} = \frac{8x^2 - 4608}{x^2}$$

$$A' = 0$$

$$8x^2 - 4608 = 0$$

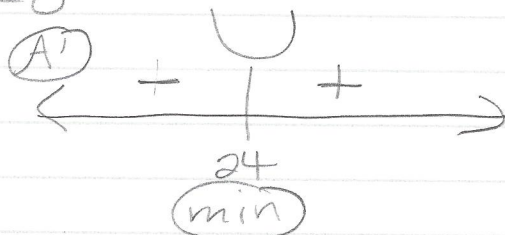
$$8x^2 = 4608$$

$$x^2 = 576$$

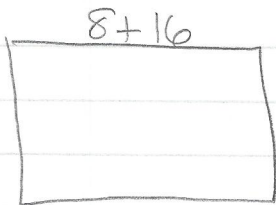
$$x = 24$$

A' undef

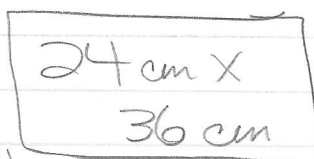
$$x = 0$$



Dimensions



$$12+24$$



$$x = 24$$

$$y = \frac{384}{24} = 16$$