

4.

4. Since the fences enclose a rectangular plot without one side, two sides have length b and one side has length a :

$$a+b+b=3803 \implies a=3803-2b$$

the area:

$$\text{area}=a \times b = (1-2b)b = 3803b - 2b^2$$

Note that the formula is for parabola. Now compute the vertex:

$$\text{vertex} = \left(\frac{3803}{4} \text{ ft}, \frac{14462809}{8} \text{ ft}^2 \right)$$

Square the unit for vertex's vertical coordinate since it is a quadratic.