

4.

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

$$a + b + b = 4070 \implies a = 4070 - 2b$$

the area:

$$\text{area} = a \times b = (4070 - 2b)b = 4070b - 2b^2$$

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

$$\text{vertex} = \left(\frac{2035}{2} \text{ ft}, \frac{4141225}{2} \text{ ft}^2 \right)$$

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