

2.

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

$$a + b + b = 2047 \implies a = 2047 - 2b$$

the area:

$$\text{area} = a \times b = (1 - 2b) b = 2047 b - 2 b^2$$

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

$$\text{vertex} = \left(\frac{2047}{4} \text{ yards}, \frac{4190209}{8} \text{ yards}^2 \right)$$

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