

4.

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

$$a+b+b=1074 \implies a=1074-2b$$

the area:

$$\text{area}=a \times b = (1074-2b)b = 1074b - 2b^2$$

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

$$\text{vertex} = \left(\frac{537}{2} \text{ yd} , \frac{288369}{2} \text{ yd}^2 \right)$$

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