

4.

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

$$a+b+b=4556 \implies a=4556-2b$$

the area:

$$\text{area}=a \times b = (4556-2b)b = 4556b - 2b^2$$

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

$$\text{vertex} = (1139 \text{ yards}, 2594642 \text{ yards}^2)$$

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