

3.

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

$$a + b + b = 4530 \implies a = 4530 - 2b$$

the area:

$$\text{area} = a \times b = (4530 - 2b)b = 4530b - 2b^2$$

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

$$\text{vertex} = \left(\frac{2265}{2} \text{ yd} , \frac{5130225}{2} \text{ yd}^2 \right)$$

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