4.

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

$a + b + b = 3679 \implies a = 3679 - 2b$

the area:

$area = a \times b = (l - 2b)\, b = 3679\, b - 2\, b^2$

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

$vertex = (\frac{3679}{4} \text{ meters} , \frac{13\,535\,041}{8} \text{ meters}^2)$

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