4.

4. There are 3 sides to fence, two sides with length b and one side with length a:

$a + b + b = 1845 \implies a = 1845 - 2b$

Now find the area:

$area = a \times b = (l - 2b)b = 1845\,b - 2\,b^2$

Notice the Parabolic formula, find the vertex:

$vertex = (\frac{1845}{4}$ meters $, \frac{3\,404\,025}{8}$ meters^2 $)$

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