4.

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

$a+b+b=1345 \implies a=1345-2b$

the area:

$\text{area}=a\times b=(1-2b)\,b=\ 1345\,b-2\,b^2$

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

$\text{vertex}=\ \left(\frac{1345}{4}\ \text{yd}\ ,\ \frac{1809025}{8}\ \text{yd}^2\ \right)$

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