1.

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

$a+b+b=2567 \implies a=2567-2b$

Now solve for the area:

$area=a\times b=(l-2b)\,b=\ 2567\,b-2\,b^2$

Notice the Parabolic function, solve for the vertex:

$vertex=\ (\frac{2567}{4}\ yd\ ,\ \frac{6\,589\,489}{8}\ yd^2\ )$

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