4.

4. There are 3 sides to fence, two sides with length b and one side with length a:
$a+b+b=4554 \implies a=4554-2b$
Now solve for the area:
$area=a \times b = (l-2b)b = 4554\,b - 2\,b^2$
Notice the Parabolic equation, solve for the vertex:
vertex= $(\frac{2277}{2}$ ft , $\frac{5\,184\,729}{2}$ ft^2)

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