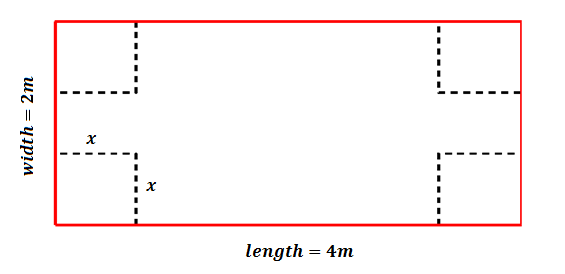
**Tutorial problems 3**

1. A rectangular metal plate has squares cut from its four

corners as illustrated and is then folded up to make an open box. Explain why do we need the restriction ? Find such dimensions of the box that the volume will be the largest.



1. A cuboid container with a base length twice its width is to be made with of metal.

Show that the height , where is the width of the base.

Express the volume, , in terms of .

Find the maximum volume.

1. A cylindrical container holds a volume of . Show that the surface area is given by . Find the dimensions so that the surface area is a minimum (minimizing the material used).
2. A rectangular plot of farmland is enclosed by of fencing material on three sides. The fourth side of the plot is bordered by a stone wall .Find the dimensions of the plot that enclose the maximum area. Find the maximum area.
3. Find the dimensions of an open box with a square base and surface area of 192 that has a maximum volume.
4. Use implicit differentiation to find :
5. Write the equation of the tangent to the curve at the point .
6. Write the equation of the normal to the curve at the point .
7. Given the curve .

Find

Show that

Show that