 **Practice – 2**

Once you feel confident with Maximum and Minimum Problems: Geometric Applications, complete problems 1 to 4. Check your answers by going to the Solutions tab in Moodle.

Instructions: Answer each of the following practice questions on a separate piece of paper. Step by step solutions are provided under the Solutions tab. You will learn the material more thoroughly if you complete the questions before checking the answers.

1. A rectangular box with two square ends has a surface area of 150 cm^2. Find the dimensions of the box if its volume is a maximum. What is the maximum volume ?

2. An open box is to be made from a square piece of material measuring 30 cm on each side. The box will be formed by cutting equal-sized squares from each corner, and then folding up the sides along the dotted lines shown in the diagram provided. Find the volume of the largest box that can be made this way.

$\longleftarrow$ 30 cm $\longrightarrow$
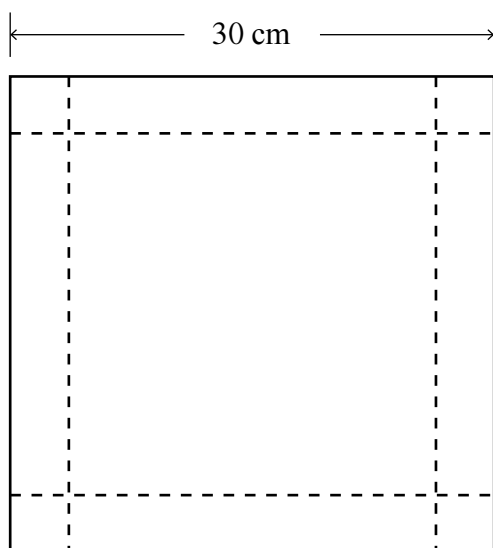
3. An open-topped can has the form of a cylinder. It has a volume of $8\,000\pi \text{ cm}^3$. If the can is made from the least amount of material, what must be its dimensions?

4. A farmer wishes to fence off a rectangular field that borders a straight river, as shown in the diagram provided. He does not need to fence the side bordering the river. The area of the rectangular field is to be $1\,800\text{ m}^2$, and the farmer wishes to use the least amount of fencing material. What should be the dimensions of the rectangular field?