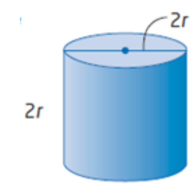
Name: ________________________ Date: ______________________

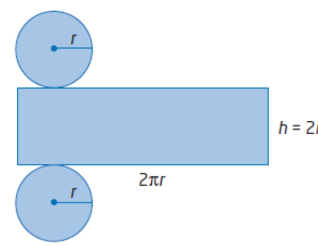
Worksheets – Optimization of Cylinders (Minimize SA and Maximize Volume)

(9.5) - Key Concepts for Maximizing the volume of a cylinder

- The maximum volume for a given surface area of a cylinder occurs when its height equals its _____________. That is, ____________ or _____________
- The dimensions of the cylinder with maximum volume for a given surface area can be found by solving the formula:
- and the height will be _________ that value, or __________

➢ Substitute h = 2r into the formula to solve for the SA formula above:





➢ Rearrange the surface area formula to solve for height:

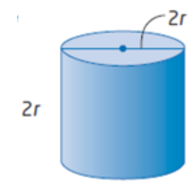
1 a. Find the dimensions of a cylinder with maximum volume that can be made with $600cm^2$ of aluminum. Round the dimensions to the nearest hundredth of a centimetre.

b. What is the volume of this cylinder, to the nearest cubic centimetre?

(9.6) – Minimize the Surface Area of a Cylinder

- The minimum surface area for a given volume of a cylinder occurs when its height equals its ____________. That is, ___________ or ____________
- The dimensions of the cylinder of minimum surface area for a given volume can be found by solving the formula:

- and the height will be ________ that value, or _________
- Substitute h = 2r into the formula to solve for the V formula above:



2 a. Determine the least amount of aluminum required to construct a cylindrical can with a 1 litre capacity, to the nearest square centimetre.

b. Describe any assumptions made.