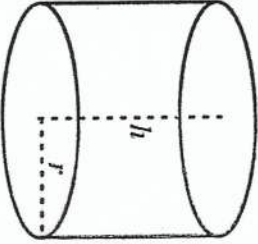
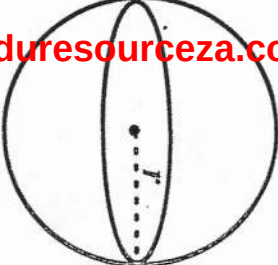
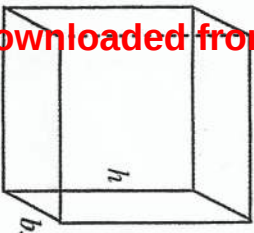
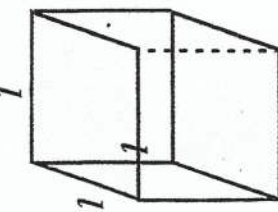




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Name	Volume	Surface Area
 Cylinder (only prism that is not a polyhedron)	$\pi r^2 h$	$2\pi r^2 + 2\pi r h$
 Sphere (not a prism nor a polyhedron)	$\frac{4}{3}\pi r^3$	$4\pi r^2$
 Cuboid or Rectangular Prism	Area of base $\times h$ $= l \times b \times h$	Sum of the areas of six rectangles $2lb + 2lh + 2bh$
 Cube	Area of base $\times h$ $= l \times l \times l$ $= l^3$	Sum of the areas of six squares $= 2l^2 + 2l^2 + 2l^2$ $= 6l^2$

How to solve problems involving maximums and minimums

Step 1 In these problems something has to be maximised or minimised

Determine an expression in one variable for this unknown entity

Use the following familiar formulae:

Rectangle

Area = length $\times$ breadth

Perimeter = $2(\text{length} + \text{breadth})$

Circle

Area = πr^2

Circumference = $2\pi r$

Rectangular prism

Volume = $l \times b \times h$

Total surface area = $2(lb + lh + bh)$

Cylinder

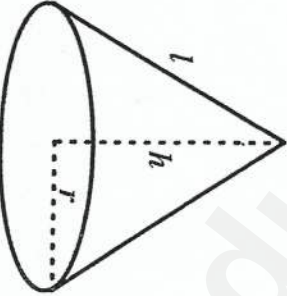
Volume = $\pi r^2 h$

Total surface area = $2\pi r h + 2\pi r^2$

Step 2 Determine the derivative with respect to the specific variable.

Step 3 Maximum or minimum values occur when the derivative is 0.

Step 4 Calculate the maximum or minimum values by means of substitution.

	Cone (not a prism nor a polyhedron)	$\frac{1}{3}\pi r^2 h$
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