




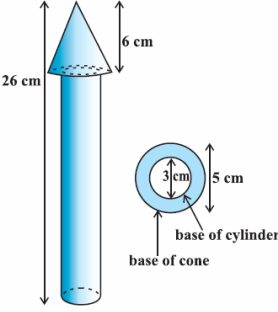
Common mistakes & How to avoid
X-Math

Chapter: Surface Areas and Volumes

Types of Question	Common Mistake	Points to be emphasized
<p>(i) Questions based on the surface area of combination of solids like cone, cylinder, hemisphere etc.</p> <p>-To find the area/ cost of the cloth required to make a tent in the shape of the combined solids</p> <p>-To find the cost of painting the surface of a vessel which is a combination of two or more solids</p>	<p>i) Misinterpreting the problem.</p> <p>ii) Error in identifying what is to be calculated: Curved Surface Area or Total Surface Area.</p> <p>iii) Error in identifying what needs to be calculated surface area or volume</p> <p>iv) Incorrect use of Formulae</p>	<p>i) Drawing a correct figure with appropriate labels and dimensions written on it is very important not only it will help you to understand the problem easily but also give an idea to examiner.</p> <p>(ii) Remember to consider the visible surface for calculating the surface area for example let three solids Hemisphere, cylinder and cone are joined together</p>  <p>Here the total surface area is not the sum of total surface area of individual solids, but sum of the curved surface area of component solids.</p> <p>When the cloth required to make the solid is to be obtained the curved surface area of the solid is to be calculated and not the total surface area.</p> <p>Consider another example</p>



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	<p>v) Not mentioning the units along with the answer</p> <p>vi) Not converting the different measurements to same units</p>	 <p>Here surface area of the solid will be = CSA of the cone + base area of the cone - base area of the cylinder</p> <p>(iii) When cost of painting the solid or cloth required to make the tent is required then we need to find the surface area. If we need to find the mass of the pole, then we need to find Volume.</p> <p>(iv) Remember the standard formulae of surface area and curved and total + volume of elementary solids</p> <p>(v) Write units along with answer.</p> <p>(vi) Always keep the dimensions in same measurement units for example if radius is in m and height is in cm then convert both to cms.</p>
<p>- A solid is melted and recasted into a number of smaller solids with given dimensions. Find the</p>	<p>i) Students generally get confused whether the surface area of the big solid is equal to the SA of the smaller</p>	<p>i) When a solid is melted and converted to another, volume of both the solids remains the same, assuming there is no</p>




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<p>number of smaller solids formed</p> <p>- A vessel whose dimensions are given is full of water. The water is emptied into another vessel of different shape with radius given. Find the height to which the water rises in the other vessel.</p>	<p>ones or it's the volume that is equal.</p> <p>ii) Error in considering the surface areas or the volumes of the two vessels equal</p> <p>ii) What should be taken as the value of π</p> <p>iii) calculation errors</p>	<p>wastage in the conversions .i.e remember Volume before = volume after conversion We cant predict whether The surface area of the two solids are equal or not</p> <p>(ii) Similarly when material is transferred from one solid to another, then also the volume of material in both the solids remains the same. i.e the volume of water, which is equal to the volume of the first vessel partially fills the second vessel. Hence, the volume of the first vessel is not equal to the volume of the 2nd vessel.</p> <p>For example: A conical vessel whose internal radius is 5 cm and height 24 cm is full of water. The water is emptied into a cylindrical vessel with internal radius 10 cm. Find the height to which the water rises in the cylindrical vessel.</p> <p>Here, Volume of cone = Volume of water = Volume of water in the cylinder \neq Volume of the cylinder (iii) Value of π if not specified can be taken as 22/7 if radius or height are multiples of 7. Also see if you can cancel out π when equating the volumes. (iv) Be careful while calculating look for</p>
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		simplifying the things before getting in actual calculations calculate till 2 decimal places.
A solid of given dimension is dropped in a vessel (cylinder), partly filled with water. If the solid is completely submerged in water, the water level in the vessel rises by a certain height. Find the radius of the vessel (cylinder).	<p>1) Error in using the dimensions given in different units during calculations.</p> <p>2) Students may consider the given height of displaced water as the total height of the water after rising by certain amount.</p> <p>3) Error in considering the surface area of the displaced water as equal to the surface area of the submerged solid.</p>	<p>1) Before doing calculations, Always make the units of all dimensions uniform so as to avoid committing mistakes.</p> <p>2) The given height of displaced water is the total height of water after rising by a certain amount – the original height of water in the vessel.</p> <p>3) In such questions, the volume of the displaced water is equal to the volume of the submerged solid. Not the surface area.</p>
Finding the metal used to make a bucket in the form of a frustum of a cone of given dimensions Also, finding the cost of the bucket if the cost of metal sheet used is given in rupees per 100 cm ² .	<p>1) Misinterpreting the question and hence finding the TSA or CSA of the frustum of the cone.</p> <p>2) Error in calculating the cost of metal used.</p> <p>3) Incorrect use of formula</p>	<p>1) The metal used to make the bucket will be = CSA of frustum + area of smaller base of the frustum.</p> <div style="text-align: center;">  </div> <p>This is because, the top of the bucket is open and hence no metal is used there. So, TSA will not be calculated. The bottom of the bucket is closed and hence metal is used there. So, only CSA</p>



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		<p>will not give the correct answer. Don't forget to mention the units.</p> <p>2) If the rate of metal is given in Rs. 15 per 100 cm². So if the area of metal used is calculated as 1000 cm². Its cost will be Rs. $1000 \times 15 / 100 = \text{Rs. } 150$ and not Rs. 1000×15</p> <p>3) Remember the formulae.</p>
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