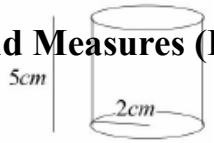
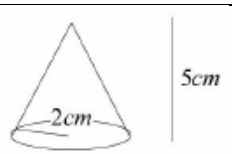
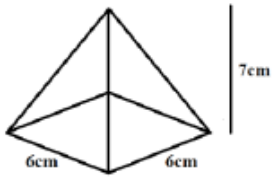
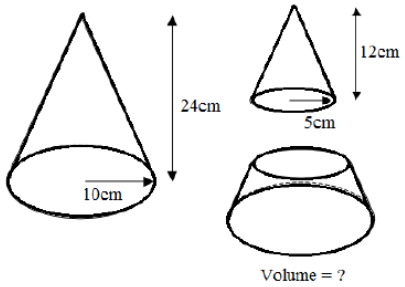
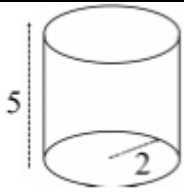
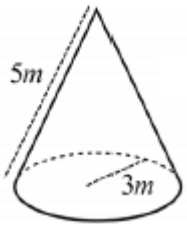
KS3 Unit 53 Cylinders Cones and Spheres

Topic: Geometry and Measures (H)

Topic/Skill	Definition/Tips	Example
1. Volume of a Cylinder	$\boldsymbol{V = \pi r^2 h}$	 $V = \pi(4)(5)$ $= 62.8cm^3$
2. Volume of a Cone	$\boldsymbol{V = \frac{1}{3}\pi r^2 h}$	 $V = \frac{1}{3}\pi(4)(5)$ $= 20.9cm^3$
3. Volume of a Pyramid	$\boldsymbol{Volume = \frac{1}{3}Bh}$ where B = area of the base	 $V = \frac{1}{3} \times 6 \times 6 \times 7 = 84cm^3$
4. Volume of a Sphere	$\boldsymbol{V = \frac{4}{3}\pi r^3}$ Look out for hemispheres – just halve the volume of a sphere.	Find the volume of a sphere with diameter 10cm. $V = \frac{4}{3}\pi(5)^3 = \frac{500\pi}{3}cm^3$
5. Frustums	A frustum is a solid (usually a cone or pyramid) with the **top removed**. Find the volume of the whole shape, then take away the volume of the small cone/pyramid removed at the top.	 $V = \frac{1}{3}\pi(10)^2(24) - \frac{1}{3}\pi(5)^2(12)$ $= 700\pi cm^3$
6. Surface Area of a Cylinder	**Curved Surface Area = $\boldsymbol{\pi dh}$** or **$\boldsymbol{2\pi rh}$** **Total SA = $\boldsymbol{2\pi r^2 + \pi dh}$** or **$\boldsymbol{2\pi r^2 + 2\pi rh}$**	 $Total\ SA = 2\pi(2)^2 + \pi(4)(5) = 28\pi$

7. Surface Area of a Cone	**Curved Surface Area = $\boldsymbol{\pi rl}$** where $l = slant\ height$ **Total SA = $\boldsymbol{\pi rl + \pi r^2}$** You may need to use Pythagoras' Theorem to find the slant height	 $Total\ SA = \pi(3)(5) + \pi(3)^2 = 24\pi$
8. Surface Area of a Sphere	$\boldsymbol{SA = 4\pi r^2}$ Look out for hemispheres – halve the SA of a sphere and add on a circle (πr^2)	Find the surface area of a sphere with radius 3cm. $SA = 4\pi(3)^2 = 36\pi cm^2$