Sectors : $\frac{\pi r^2 \theta}{360} = \frac{22}{7} \times 14 \times 14 \times \frac{90}{360} = 154 m^2$

$S_1 + S_2 + S_3 + S_4 = 4 \times 154 = 616 m^2$

Total area $= 60 \times 45 = 2700 m^2$

$2700 - 616 = 2084 m^2$

Volume & Surfaces

make sure to go through all important formulae

	Cube	Cuboid
No. of sides	12	12
No. of faces	6	6
No. of vertices	8	8
Diagonal	$\sqrt{3}a$	$\sqrt{l^2+b^2+h^2}$
Volume	a^3	lbh
Surface Area	$6a^2$	$2(lb+bh+lh)$

like rectangle & square

$V = a^3 \quad V \propto a^3$

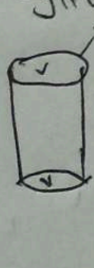
Side	a	$2a$	$3a$
volume	a^3	$8a^3$	$27a^3$
S.A	$6a^2$	$24a^2$	$54a^2$

$V = (2a)^3 = 8a^3$

$SA = 6(2a)^2$

$6 \times 4a^2 = 24a^2$

Cylinder



πr^2

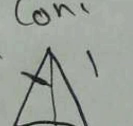
Volume $= \pi r^2 h$

Curved Surface Area $\rightarrow 2\pi rh$ $\quad \pi r^2 + \pi r^2 = 2\pi r^2$

Total SA $\rightarrow$ take everything

$2\pi rh + 2\pi r^2$

Cone



h, l, πr^2

$l^2 = h^2 + r^2$

Volume $= 1/3 \pi r^2 h$

$CSA = \pi rl$

$TSA : \pi rl + \pi r^2$

Slant Height : $l = \sqrt{(h^2+r^2)}$

Sphere & Hemisphere

volume = $\frac{1}{3}\pi r^3$

SA = $4\pi r^2$

volume = $\frac{2}{3}\pi r^3$

CSA = $2\pi r^2$ TSA = $3\pi r^2$

1 litre = 1000 cm^3 , 1 cubic decimetre = 1 litre

10 cm × 10 cm × 10 cm = 1 lit

10 dm × 10 dm × 10 dm = 10 cm × 10 cm × 10 cm

10 dm = 10 cm

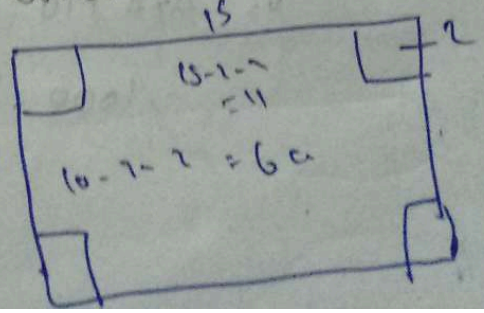
1) A jay has 2 cones with his 1st cone has radius twice the other & height half the other what is the volume ratio of 1st & 2nd cones

1	2	$V = \frac{1}{3}\pi r^2 h$
$2r$	r	$V_1 : V_2 = 2:1$
h	h	$\frac{V_1}{V_2} = \frac{\frac{1}{3}\pi (2r)^2 h}{\frac{1}{3}\pi r^2 h}$

2) 2 cylinders have their radii into ratio 4:7. If their heights are in ratio of 21:8 then their volumes in what ratio

1	2	$V = \pi r^2 h$
4a	7a	$\frac{V_1}{V_2} = \frac{\pi (4a)^2 21h}{\pi (7a)^2 8h}$ = $V_1 : V_2 = 6:7$
21b	8b	

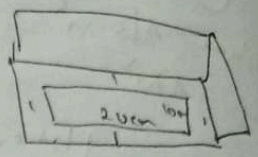
3) Ramesh, a fabricator, has a metal sheet with dimension 15 cm × 10 cm. Squares with a side 2 cm are cut from each of four corners. The sheet is then folded to form a planter with a depth 2 cm. What will be the volume of planter



$V = lxbxh$

$= 132\ cm^3$

4.) A closed metal box has dimensions 20 cm × 15 cm × 10 cm. Thickness of the metal sheet is 1 cm. How much liquid can this box store



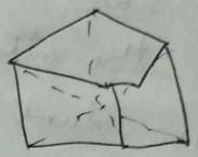
$20 - 1 - 1 = 18\text{cm}$

$15 - 1 - 1 = 13\text{cm}$

$10 - 1 - 1 = 8\text{cm}$

$lbh = 18 \times 13 \times 8 = 1.872\text{L}$

5.) Ram has a cubical dice with total length of its space diagonals as 16 cm. What is total length of edges of this dice cube has 4 space diagonals



It's a cube ☺

4 - Space diagonals

$4a = 16\text{ cm}$

$a = 4\text{cm}$

$\sqrt{3}s = 4 =$ length of diagonal

$s = \frac{4}{\sqrt{3}}$ 12 Sides $= \frac{12 \times 4}{\sqrt{3}} = 16\sqrt{3}$

6.) A solid metallic box with dimension l, b and h respectively weighs 50 kg. What will be the change in weight. if all the dimensions are halved

$lxbxh = 50 \quad \frac{1}{2} \times \frac{b}{2} \times \frac{h}{2} = \frac{1}{8}(lbh) = \frac{1}{8} \times 50 = 6.25\text{ kg}$

7.) From a cube of side 10cm, a sq hole of side 4cm is hollowed from end to end. What is the volume of solid left.

$V_1 = a^3 = 10^3 = 1000\text{cm}^3$

$V_2 = 4 \times 4 \times 10 = 160\text{cm}^3$

$1000 - 160 = 840\text{cm}^3$

8.) A solid
water
a tank
of wat
1 ball
40 b

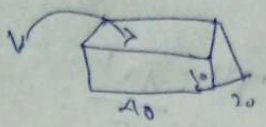
9.) A w
dept
arou
what

10.)

8.) A solid spherical ball can displace 5 cubic metres of water. If 40 such balls are immersed in a tank at a time, what will be the rise in level of water. Dimensions are 10 × 20 × 10

1 ball → 5 m^3

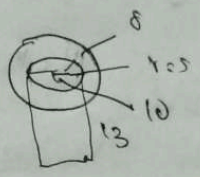
40 balls → 40 × 5 m^3 = 200 m^3



200 = 40 × 10 × h

$h = \frac{200\ m^3}{10 \times 20\ m^2} = \frac{1}{4} m = h \uparrow \frac{100}{4}\ cm = 25\ cm$

9.) A well with inside diameter 10m is dug 13m deep. The soil taken out is spread all around it to form an embankment of width 3m. What is the height of embankment



$\pi r^2 h = \pi \times 5 \times 5 \times 13\ m^3$

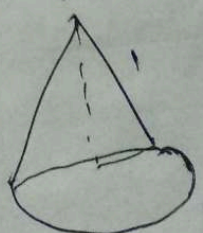
$C_1 = \pi \times 5 \times 5$

$C_2 = \pi \times 8 \times 8$

$C_2 - C_1 = \pi(64 - 25) = \pi \times 39\ m^2$

$\pi \times 5 \times 5 \times 13 = \frac{25}{3} \pi\ m = h = 8\frac{1}{3}\ m$

10.) Tribals wish to setup a temporary tent. The base area of the tent would be 616 sq.m and height 14m. The width of canvas available in market is $11\sqrt{2}$ m. How much length of canvas is need



$\pi r^2 = 616 = \frac{22}{7} \times r^2 \quad r^2 = 14\,m$

Since base is circle

$l^2 = 14^2 + 14^2 = \quad l = 14\sqrt{2}$

$\pi r l\,(CSA) = \frac{22}{7} \times 14 \times 14\sqrt{2} = m^2$

length $= \frac{\pi r l}{11\sqrt{2}} = 56m$

11) Three Solid iron balls are melted to form a single solid iron ball. The radii of these balls are 6 cm, 8 cm, 10cm. what will be radius of new ball formed

$\frac{4}{3}\pi r^3$

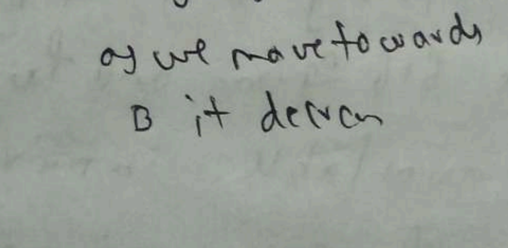
$\frac{4}{3}\pi(6^3 + 8^3 + 10^3) = \frac{4}{3}\pi R^3$

$R = 12\,cm$

O OO
\ (1)
O
$V_1 = V_2$

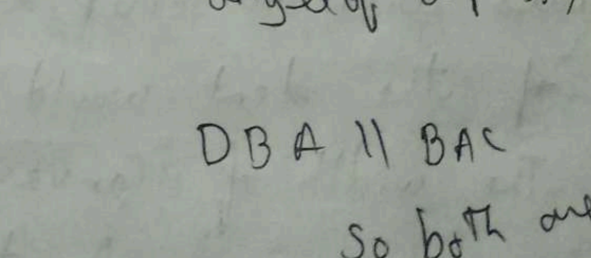
Height

Angle of elevation & Depression



angle of elevation

as we move towards B it decreases



DBA
||

angle of depression

DBA || BAC

So both are equal