Mensuration Assignment -1

1	A	9	C	17	B	25	B	33	C	
2	C	10	C	18	B	26	D	34	C	
3	B	11	C	19	D	27	A	35	B	
4	B	12	A	20	A	28	D	36	D	
5	A	13	C	21	C	29	B	37	C	
6	D	14	C	22	C	30	B	38	C	
7	A	15	A	23	C	31	D	39	A	
8	C	16	A	24	A	32	B	40	A	

1. (A)

(1) Side of one square = $\frac{40}{4} = 10$ cm.

[∵Perimeter = 4 × side]

Side of other square = $\frac{32}{4}$

= 8 cm.

According to the question,

Area of third square

= $(10)^2 - (8)^2 = 100 - 64$

= 36 sq.cm.

Side of third square = $\sqrt{36}$

= 6 cm.

Its perimeter = 4 × 6 = 24 cm.

2. (C) Sides of the squares are 6 cm. 8 cm, 10 cm, 19 cm and 20 cm respectively.

Sum of their areas = $(6^2 + 8^2 + 10^2 + 19^2 + 20^2)$ cm^2

=(36+64+100 + 361 + 400)cm^2

= 961 cm^2

∴ Area of largest other square

= 961 cm^2

∴ Its side = $\sqrt{961}$ = 31 cm

∴ Required perimeter

= 4 × 31 = 124 cm.

3. (b) Let the side of square be a units. Area of this square $=a^2$

The diagonal of square

= $\sqrt{2}\,a$

∴ Area of square = $2a^2$

∴ Required ratio = $a^2 : 2a^2$

= 1 : 2

4. (b)

(2) Side of the first square

= $\frac{40}{4} = 10$ cm

Side of the second square

= $\frac{24}{4} = 6$ cm

Difference of the areas of these squares

= (10 × 10 – 6 × 6) cm^2

= (100 – 36) cm^2

= 64 cm^2

∴ Area of the third square

= 64 cm^2

∴ Side of third square

= $\sqrt{64} = 8$ cm

∴ Perimeter of this square

= (4 × 8) cm

= 32 cm

5. (a)

Area of the rectangular garden $=12\times5=60$ m^2

=Area of the square garden

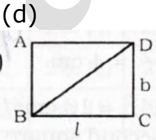
So that side of the square garden

$= = \sqrt{60}m^2$

$= \sqrt{2} \times side$

$= \sqrt{2} \times \sqrt{60} = \sqrt{120} = \sqrt{14 \times 30} = 2\sqrt{30}cm$

6. (d)

(4) 

BD = length of diagonal

= speed × time

= $\frac{52}{60}$ × 15 = 13 metre

= $\sqrt{l^2 + b^2}$

⇒ $l^2 + b^2 = 169$

Again,

$(l + b) = \frac{68}{60} \times 15 = 17$ ...(ii)

∴ $(l + b)^2 = l^2 + b^2 + 2lb$

⇒ $17^2 = 169 + 2\,l\,b$

⇒ $2\,l\,b = 289 - 169 = 120$

⇒ $l\,b = \frac{120}{2} = 60$ m^2

7. (a)

Area of garden without street

= 200 × 180 = 36000 sq.metre

Area of garden with street

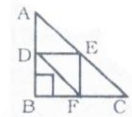
= 220 × 200 = 44000 sq.metre

∴ Area of the path

= 44000 – 36000

= 8000 sq.metre

8. (c)



$3^2 + 4^2 = 5^2$

Δ ABC is a right angled tria

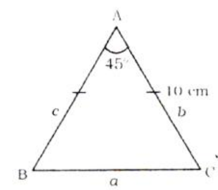
∴ ABC = $\frac{1}{2}$ × AB × BC

= $\frac{1}{2}$ × 3 × 4 = 6cm^2

∴ Required Area of Δ DEF

= $\frac{1}{4} \times 6 = \frac{3}{2}$ sq.cm.

9. (c)



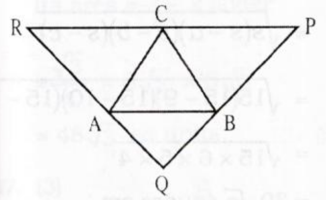
AB = AC = 10 cm

∴ Area = $\frac{1}{2}$ bc sin A

= $\frac{1}{2}$×10×10 sin 45°

= $\frac{50}{\sqrt{2}} = \frac{50 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} = 25\sqrt{2}$ cm^2

10. (c)



AQ || CB ,and AC || QB

$\therefore$ AQBC, is a parallelogram

$\Rightarrow$ BC = AQ

Again, AR || BC and AB || RC

$\therefore$ ARCB ,is a parallelogram.

$\Rightarrow$ BC = AR

$\Rightarrow$ AQ = AR

$\Rightarrow AQ = AR = \frac{1}{2}QR$

$\Rightarrow BC = \frac{1}{2}QR$

Similarly, $AB = \frac{1}{2}PR$ and

$AC = \frac{1}{2}PQ$

$\therefore$ Required ratio

11. (c) Semi perimeter(s) =9+10+11/2=15 cm.

Area of triangle

$= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{15(15-9)(15-10)(15-}$

$= \sqrt{15 \times 6 \times 5 \times 4}$

$= 30\sqrt{2}$ square cm.

12. (a)

(1) Let the sides of triangle be a, b and c respectively.

$\therefore 2s = a + b + c = 32$

$\Rightarrow 11 + b + c = 32$

$\Rightarrow b + c = 32 - 11 = 21$ .....(i)

and $b - c = 5$ ......(ii)

By adding equations (i) and (ii)

$2b = 26 \Rightarrow b = 13$

$\therefore c = 13 - 5 = 8$

$\therefore 2s = 32 \Rightarrow s = 16$

$a = 11,\ b = 13,\ c = 8$

$\therefore$ Area of triangle

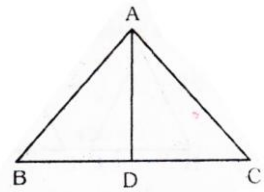
$= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{16(16-11)(16-13)(16-8)}$

$= \sqrt{16 \times 5 \times 3 \times 8}$

$= 8\sqrt{30}$ sq. cm.

13. (c)



AB = BC = CA = $2a$ cm,

AD $\perp$ BC

$AD = \sqrt{AB^2 - BD^2}$

$= \sqrt{4a^2 - a^2} = \sqrt{3}\,a$

$\therefore \sqrt{3}\,a = 15$

$\Rightarrow a = 5\sqrt{3}$

$\therefore 2a = \text{Side} = 10\sqrt{3}$ cm

$\therefore$ Area of triangle

$= \frac{\sqrt{3}}{4} \times \left(10\sqrt{3}\right)^2$

$= 75\sqrt{3}$ sq. cm.

14. (c)

$15^2 + 20^2 = 25^2$

$\therefore$ The triangular field is right angled.

$\therefore$ Area of the field

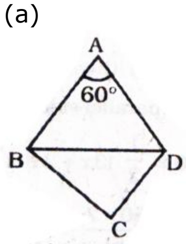
$= \frac{1}{2} \times 15 \times 20$

= 150 sq. metre

$\therefore$ Cost of sowing seeds

= 150 × 5 = Rs. 750

15. (a)



Side $= \frac{40}{4} = 10$ cm

AB = AD = 10 cm

$\angle ABD = \angle ADB = 60°$

$\therefore$ Area of the rhombus

$= 2 \times \frac{\sqrt{3}}{4} \times (AB)^2$

$= 2 \times \frac{\sqrt{3}}{4} \times 10 \times 10$

$= 50\sqrt{3}\ cm^2$

16. (a)

17. (b) Let the sides of parallelogram be 5x and 4x

Base x Height = Area of parallelogram

= Area of parallelogram

$\therefore 5x \times 20 = 1000$

$\Rightarrow x = \frac{1000}{5 \times 20} = 10$

$\therefore$ Sides = 50 and 40 units

$\therefore 40 \times h = 1000$

$\Rightarrow h = \frac{1000}{40} = 25$ units

18. (b)

Area of the parallelogram

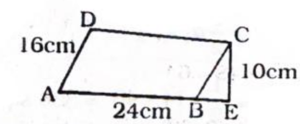
= Base × Height

= 15 × 12 = 180 sq.cm.

$\therefore$ 180 = 18 × height

$\Rightarrow$ Height = 10 cm

19. (d)



Area of the parallelogram

= Base × Height

= 24 × 10 = 240 sq.cm.

If the required distance be x cm, then

$240 = 16 \times x$

$\Rightarrow x = \frac{240}{16} = 15$ cm

20. (a)

Diagonal of cube $= \sqrt{3a^2}$

$\therefore$ According to question

$\sqrt{3}\,a = 2\sqrt{3}$

$\Rightarrow a = 2$

$\therefore$ Its volume = $a^3 = 2^3$

= 8 cu cm

21. (c) Required answer =volume of larger cube/volume of smaller

$= \frac{(15)^3}{(3)^3} = \frac{15 \times 15 \times 15}{3 \times 3 \times 3}$

= 5 × 5 × 5 = 125

22. (c) Diagonal of a cube

$= \sqrt{3} \times \text{side}$

$4\sqrt{3} = \sqrt{3} \times \text{side}$

$\therefore$ Side = 4 cm

$\therefore$ Volume of the cube

$= (\text{side})^3 = (4)^3 = 64\ cm^3$

23. (c) Let the side of the two cubes are x and y.

According to the question.

$$\frac{x^3}{y^3} = \frac{27}{64} = \frac{(3)^3}{(4)^3} \therefore \frac{x}{y} = \frac{3}{4}$$

We know that surface area of the cube
$= 6 \times (\text{side})^2$
$\therefore$ Ratio of their surface areas

$$= \frac{6x^2}{6y^2} = \frac{6 \times 3^2}{6 \times 4^2} = \frac{9}{16} = 9 : 16$$

24. (a) The length of the longest rod = The diagonal of the hall.

$$= \sqrt{l^2 + b^2 + h^2}$$
$$= \sqrt{10^2 + 6^2 + 4^2}$$
$$= \sqrt{100 + 36 + 16} = \sqrt{152}$$
$$= \sqrt{2 \times 2 \times 38} = 2\sqrt{38} \text{ m}$$

25. (b) We have
$2 \times$ volume of cube = volume of cuboid
$\Rightarrow 2 \times (\text{edge})^3 = 9 \times 8 \times 6$ cu.cm.
$\Rightarrow (\text{edge})^3 = 9 \times 8 \times 3$
$\Rightarrow$ Edge $= \sqrt[3]{3 \times 3 \times 3 \times 2 \times 2 \times 2}$
$= 3 \times 2 = 6$ cm.
$\Rightarrow$ Total surface area of the cube
$= 6 \times (\text{edge})^2$
$= 6 \times 6 \times 6$ 216 cm^2.

26. (d) Length of largest bamboo

$$= \sqrt{(5)^2 + (4)^2 + (3)^2}$$
$$= \sqrt{25 + 16 + 9} = \sqrt{50}$$
$$= \sqrt{25 \times 2} = 5\sqrt{2} \text{ m}$$

27. (b) Let the length of tank = x dm
Depth =x/3 dm

$$\text{Breadth} = \left(x - \frac{x}{3}\right) \times \frac{1}{3} \times \frac{1}{2}$$
$$= \frac{2x}{3} \times \frac{1}{3} \times \frac{1}{2} = \frac{x}{9} \text{ dm}$$

Volume of tank

$$= x \times \frac{x}{9} \times \frac{x}{3} = \frac{x^3}{27}$$

According to the ques-tion,

$$\frac{x^3}{27} = 216$$
$\Rightarrow x^3 = 27 \times 216$
$\Rightarrow x = (27 \times 216)^{1/3}$
$= 3 \times 6 = 18$ dm

28. (a) The external dimensions of the box are :
Length =20 cm, Breadth =12 cm. Height=10 cm
External volume of the box
$20 \times 12 \times 10 = 2400 \text{ cm}^3$
Thickness of the wood =1 cm
Internal length =20-2=18 cm
Internal breadth =12-2=10 cm
Internal height =10-2=8 cm
Internal volume $= 18 \times 10 \times 8 = 1440 \text{ cm}^3$
Volume of the wood $= (2400-1440) \text{ cm}^3 = 960 \text{ cm}^3$

29. (d) surface area of a small cube $= 6 \times (\text{edge})^2 = 6 \times 1 = 6 \text{ cm}^2$
Surface area of the large cube $= 6(5)^2 = 6 \times 25 \text{ cm}^2$
So that required ratio $= 6/6 \times 25 = 1/25$, i.e., 1:25.

30. (b)
(2) Let the length of the tank be x cm.

$$\therefore \text{ Depth} = \frac{x}{3}$$
$$\text{Breadth} = \frac{1}{2} \times \frac{1}{3} \times \left(x - \frac{x}{3}\right)$$
$$= \frac{x}{9}$$

Now,

$$x \times \frac{x}{3} \times \frac{x}{9} = 216 \times 1000$$
$\Rightarrow x^3 = 27 \times 216 \times 1000$
$\Rightarrow x = (27 \times 216 \times 1000)^{1/3}$
$\Rightarrow x = 3 \times 6 \times 10$
$= 180$ cm $= 18$ dm

31. (b)
(2) Volume of cuboid
$= 9 \times 8 \times 6 = 432 \text{ cm}^2$
According to the question,
Volume of cube

$$= \frac{432}{2} = 216 \text{ cm}^3$$

$\therefore$ Edge of cube $= \sqrt[3]{216} = 6$ cm.
$\therefore$ Total surface area of cube
$= 6 \times (6)^2 = 216 \text{ cm}^2$

32. (d) If the length of the edge of cube be x cm then
diagonal $= \sqrt{3}x$ cm
$\therefore \sqrt{3}x = 8\sqrt{3} \Rightarrow x = 8$ cm
$\therefore$ Surface area of the cube
$= 6x^2$
$= 6 \times 8 \times 8$
$= 384$ sq. cm

33. (b) Length of the longest pole

$$= \sqrt{12^2 + 8^2 + 9^2}$$
$$= \sqrt{144 + 64 + 81} = \sqrt{289} = 17$$

34. (C) Diagonal of the cube
$= 6\sqrt{3}$ cm
$\therefore \sqrt{3} \times \text{edge} = 6\sqrt{3}$ cm
$\Rightarrow$ Edge $= 6$ cm
$\therefore$ Total surface area : Volume
$= 6 \times 6^2 : 6^3 = 1 : 1$

35. (b)
Length of the edge of the box
$= \sqrt[3]{3.375}$
$= \sqrt[3]{1.5 \times 1.5 \times 1.5} = 1.5$ Meter

36. (d) Area of the floor =volume of room/Height of room
=204/6=34 sq. m.

37. (c)
(3) Volume of cylindrical vessel $= \pi r^2 h$

$$\text{Volume of cone} = \frac{1}{3}\pi r^2 h$$
$$\therefore \text{ Number of cones} = \frac{\pi r^2 h}{\frac{1}{3}\pi r^2 h} = 3$$

38. (c) The curved surface of cylinder
$= 2\pi rh = a$
Area of base $= \pi r^2 = b$
$\therefore 2\pi rh = a$
$\Rightarrow 4\pi^2 r^2 h^2 = a^2$
$\Rightarrow 4\pi b h^2 = a^2$

$$\Rightarrow h^2 = \frac{a^2}{4\pi b}$$
$$\Rightarrow h = \frac{a}{2\sqrt{\pi b}} \text{ cm.}$$

39. (a) Lateral surface area of the inder =
inder $= 2\pi rh$

$$= 2 \times \frac{22}{7} \times \frac{7}{2} \times 16$$

$= 352$ sq.cm.

40. (a)
(1) Area of the curved surf

$$= \frac{1}{3} \times 462 = 154 \text{ sq.cm}$$

$\therefore 2\pi rh + 2\pi r^2 = 462$
$\Rightarrow 154 + 2\pi r^2 = 462$
$\Rightarrow 2\pi r^2 = 462 - 154 = 308$

$$\Rightarrow r^2 = \frac{308}{2\pi} = \frac{308 \times 7}{2 \times 22} =$$

$\Rightarrow r = \sqrt{49} = 7$ cm