CBSE Sample Paper-03
SUMMATIVE ASSESSMENT –II
MATHEMATICS
Class – IX

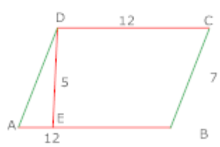
Time allowed: 3 hours **Maximum Marks: 90**

General Instructions:

a) All questions are compulsory.
b) The question paper consists of **31** questions divided into five sections – A, B, C, D and E.
c) Section A contains 4 questions of 1 mark each which are multiple choice questions, Section B contains 6 questions of 2 marks each, Section C contains 8 questions of 3 marks each, Section D contains 10 questions of 4 marks each and Section E contains three OTBA questions of 3 mark, 3 mark and 4 mark.
d) Use of calculator is not permitted.

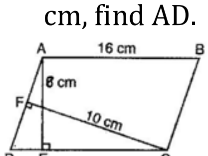
Section A

1. A cuboid having surface areas of 3 adjacent faces as a, b and c has the volume
2. Find the mean of the first five multiples of 3?
3. If P(e)= 0.25 what is the value of P(not E)
4. Find the area of parallelogram in the adjoining figure.



Section B

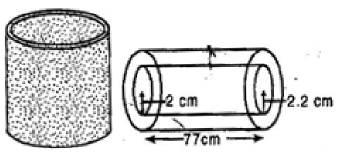
5. The floor of a rectangular hall has a perimeter 250 m. If the cost of painting the four walls at the rate of Rs. 10 per m^2 is Rs. 15000, find the height of the hall.
6. The paint in a certain container is sufficient to paint an area equal to 9.375 m^2. How many bricks of dimensions 22.5 cm x 10 cm x 7.5 cm can be painted out of this container?
7. If two equal chords of a circle intersect within the circle, prove that the line joining the point of intersection to the centre makes equal angles with the chord.
8. In figure, ABCD is a parallelogram. AE $\perp$ DC and CF $\perp$ AD. If AB = 16 cm, AE = 8 cm and CF = 10 cm, find AD.



9. The mean of 7 observations is 20. If the mean of the first 4 observations is 12 & that of last 4 observations is 28, find the 4th observations?
10. If the mean of 5 observation x, x + 4, x + 8, x + 12, x + 16 is 13, find the mean of the observations?

Section C

11. Show that is diagonals of a quadrilateral bisect each other at right angles, then it is a rhombus.
12. Show that the diagonals of a square are equal and bisect each other at right angles.
13. Prove that if chords of congruent circles subtend equal angles at their centres, then the chords are equal
14. The volume of a rectangular slower of stone is 10368 dm^3 and is dimensions are in the ratio of 3:2:1. (i) Find the dimensions (ii) Find the cost of polishing its entire surface @ Rs. 2 per dm2.
15. A metal pipe is 77 cm long. The inner diameter of a cross section is 4 cm, the outer diameter being 4.4 cm. [See fig.]. Find its:
    (i) Inner curved surface area
    (ii) Outer curved surface area
    (iii) Total surface area



16. The inner diameter of a cylindrical wooden tripe is 24 cm. and its outer diameter is 28 cm. the length of wooden tripe is 35 cm. find the mass of the tripe, if 1 cu cm of wood has a mass of 0.6 g.
17. The mean of 5 numbers is 39. If one number is excluded, their mean is 35, find the excluded number.
18. A tyre manufacturing company kept a record of the distance covered shows the results of 1000 tyres

Distance(in km)	Less then 4000	4000 to 9000	9001 to 14000	More then 14000
Frequency	20	210	325	445

If you buy a tyre of this company. What is the Probability that

(i) it will need to be replaced before it has covered 4000 km

(ii) it will last more than 9000 km

(iii) it will need to be replaced after it has covered somewhere between 4000 km and 14000 km

Section D

19. Construct a triangle ABC in which BC = 7cm $\angle B = 75°$ and AB+AC=9cm
20. Construct a triangle of ABC in which BC = 8cm $\angle B = 45°$ and $AB - AC = 3.5cm$

21. If two equal chords of a circle intersect within the circle, prove that the segments of one chord are equal to corresponding segments of the other chord.
22. D, E and F are respectively the mid-points of the sides BC, CA and AB of a Δ ABC. Show that:
    (i) BDEF is a parallelogram.
    (ii) ar (DEF) = $\frac{1}{4}$ ar (ABC)
    (iii) ar (BDEF) = $\frac{1}{2}$ ar (ABC)
23. Prove that if the diagonals of a quadrilateral are equal and bisect each other at right angles then it is a square.
24. If area of $\Delta PAB = K$ and two points A and B are positive real number K. find the lows of a point p
25. A hemispherical bowl made of brass has inner diameter 105 cm. Find the cost of tin-plating it on the inside at the rate of Rs. 16 per 100 cm^2.
26. The diameter of the moon is approximately one fourth the diameter of the earth. Find the ratio of their surface areas.
27. Find the unknown entries (a, b, c, d, e, f) from the following frequency distribution of heights of 50 students in a class.

Class Intervals (heights in cm)	Frequency	Cumulative Frequency
150-155	12	a
155-160	b	25
160-165	10	c
165-170	d	43
170-175	e	48
175-180	2	f

28. The weekly pocket expenses of students are given below:

POCKET EXPENSES (in Rs.)	45	40	59	71	58	47	65
NO. OF STUDENTS	7	4	10	6	3	8	1

Find the probability that the weekly pocket expenses of a student are

(a) (i) Rs 59 (ii) more than Rs 59 (iii) less than Rs 59

(b) Find the sum of probabilities computed in (i), (ii), and (iii)s

29. OTBA Question for 3 marks from Algebra. Material will be supplied later.
30. OTBA Question for 3 marks from Algebra. Material will be supplied later.
31. OTBA Question for 4 marks from Algebra. Material will be supplied later.

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Answers

Section A

1. $\sqrt{abc}$
2. 9
3. 0.75
4. 60 square foot

Section B

5. Given: Perimeter of rectangular wall = $2(l+b)$ = 250 m ……….(i)

Now Area of the four walls of the room = $\dfrac{\text{Total cost to paint walls of the room}}{\text{Cost to paint 1 m}^2\text{ of the walls}}$

$= \dfrac{15000}{10} = 1500\text{ m}^2$ ……….(ii)

$\because$ Area of the four walls = Lateral surface area = $2(bh+hl) = 2h(b+l) = 1500$

$\Rightarrow$ $250\times h = 1500$ [using eq. (i) and (ii)]

$\Rightarrow$ $h = \dfrac{1500}{250} = 6$ m

Hence required height of the hall is 6 m.

6. Given: Length of the brick (l) = 22.5 cm, Breadth (b) = 10 cm and Height (h) = 7.5 m

$\therefore$ Surface area of the brick = $2(lb+bh+hl)$ = 2 (22.5 x 10 + 10 x 7.5 + 7.5 x 22.5)

= 2 (225 + 75 + 468.75)

= 937.5 cm^2

= 0.09375 m^2 [1 cm = 0.01 m]

Now No. of bricks to be painted = $\dfrac{\text{Total area to be painted}}{\text{Area of one brick}} = \dfrac{9.375}{0.09375} = 100$

Hence 100 bricks can be painted.

7. Given: AB and CD be two equal chords of a circle with centre O intersecting each other with in the circle at point E. OE is joined.

To prove: $\angle$OEM = $\angle$OEN

Construction: Draw OM $\perp$ AB and ON $\perp$ CD.

Proof: In right angled triangles OME and ONE,

$\angle$OME = $\angle$ONE [Each 90°]

OM = ON [Equal chords are equidistant from the centre]

OE = OE [Common]

$\therefore$ Δ OME $\cong$ Δ ONE [RHS rule of congruency]

$\therefore$ $\angle$OEM = $\angle$OEN [By CPCT]

8. ABCD is a parallelogram.

$\therefore$ DC = AB $\Rightarrow$ DC = 16 cm

AE $\perp$ DC [Given]

Now Area of parallelogram ABCD = Base x Corresponding height

= DC x AE = 16 x 8 = 128 cm^2

Using base AD and height CF, we can find,

Area of parallelogram = AD x CF

$\Rightarrow$ 128 = AD x 10 $\Rightarrow$ AD = $\frac{128}{10}$ = 12.8 cm

9. Since mean of 7 observations = 20

$\therefore$ Total of 7 observation = $20\times7 = 140$

$\Rightarrow$ Mean of first 4 observations = 12

$\therefore$ Total of first 4 observation = $12\times4=48$

$\Rightarrow$ Mean of first 4 observations = 28

$\therefore$ Total of first 4 observation = $4\times28=112$

$\therefore$ Total of 7 observation + 4th observation = 48 + 112

140 + 4th observation = 160

$\Rightarrow$ 4th observation = 160 – 140 = 20

10. $\bar{x} = \frac{\sum xi}{n}$

$$\Rightarrow 13 = \frac{x+(x+4)+(x+8)+(x+12)+(x+16)}{5}$$

$\Rightarrow 5\times13 = 5x+40$

$\Rightarrow 13 = x+8$

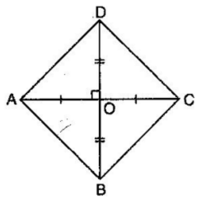
$\therefore x = 5$

$\therefore$ The given set of 5 observations are 5, 9, 13, 17, 21

$$\bar{x} = \frac{5+9++13+17+21}{5} = 12.8$$

Section C

11. Given: Let ABCD is a quadrilateral.



Let its diagonal AC and BD bisect each other at right angle at point O.

$\therefore$ OA = OC, OB = OD

And $\angle AOB = \angle BOC = \angle COD = \angle AOD = 90^\circ$

To prove: ABCD is a rhombus.

Proof: In ΔAOD and ΔBOC,

OA = OC [Given]

$\angle AOD = \angle BOC$ [Given]

OB = OD [Given]

$\therefore$ $\Delta AOD \cong \Delta COB$ [By SAS congruency]

$\Rightarrow$ AD = CB [By C.P.C.T.] ……….(i)

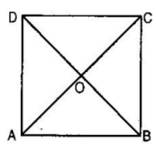
Again, In ΔAOB and ΔCOD,

OA = OC [Given]

$\angle AOB = \angle COD$ [Given]

OB = OD [Given]

$\therefore$ $\Delta AOB \cong \Delta COD$ [By SAS congruency]



$\Rightarrow$ AD = CB [By C.P.C.T.] ……….(ii)

Now In ΔAOD and ΔBOC,

OA = OC [Given]

$\angle AOB = \angle BOC$ [Given]

OB = OB [Common]

$\therefore$ $\Delta AOB \cong \Delta COB$ [By SAS congruency]

$\Rightarrow$ AB = BC [By C.P.C.T.] ……….(iii)

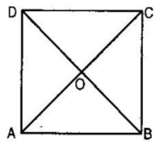
From eq. (i), (ii) and (iii),

AD = BC = CD = AB

And the diagonals of quadrilateral ABCD bisect each other at right angle.

Therefore, ABCD is a rhombus.

12. Given: ABCD is a square. AC and BD are its diagonals bisect each other at point O.



To prove: AC = BD and AC $\perp$ BD at point O.

Proof: In triangles ABC and BAD,

AB = AB [Common]

$\angle ABC = \angle BAD = 90^\circ$

BC = AD [Sides of a square]

$\therefore$ $\Delta ABC \cong \Delta BAD$ [By SAS congruency]

$\Rightarrow$ AC = BD [By C.P.C.T.] Hence proved.

Now in triangles AOB and AOD,

AO = AO [Common]

AB = AD [Sides of a square]

OB = OD [Diagonals of a square bisect each other]

$\therefore$ $\Delta AOB \cong \Delta AOD$ [By SSS congruency]

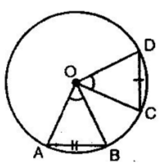
$\angle AOB = \angle AOD$ [By C.P.C.T.]

But $\angle AOB + \angle AOD = 180^\circ$ [Linear pair]

$\therefore$ $\angle AOB = \angle AOD = 90^\circ$

$\Rightarrow$ OA $\perp$ BD or AC $\perp$ BD Hence proved.

13. Given: In a circle (O, r), AB and CD subtend two angles at the centre such that $\angle AOB = \angle COD$



To Prove: AB = CD

Proof: : In ΔAOB and ΔCOD,

AO = CO [Radii of the same circle]

BO = DO [Radii of the same circle]

$\angle AOB = \angle COD$ [Given]

$\therefore$ $\Delta AOB \cong \Delta COD$ [By SAS axiom]

$\Rightarrow$ AB = CD [By CPCT]

Hence proved.

14. Let the length of the block be 3xdm

Width =2x dm and height = x dm

Volume of the block = 10368 dm^3

$\therefore \quad 3x \times 2x \times x = 10368$

$or \quad x^3 = \dfrac{10368}{6}$

$= 1728$

$\therefore \quad x = \sqrt[3]{1728}$

$= \sqrt[3]{12 \times 12 \times 12}$

$= 12$

Also 2x = 24 and 3x = 36

Thus dimensions of the block are 36dm, 24dm and 12dm

Surface area of the block = $2(36 \times 24 + 24 \times 12 + 36 \times 12)\, dm^2$

= 2(864+288+432) dm^2

= $2 \times 1584 dm^2$

= $3168 dm^2$

Cost of polishing the surface = $Rs(2 \times 3168)$

= Rs6336

15. Length of the pipe = 77 cm, Inner diameter of cross-section = 4 cm

$\Rightarrow$ Inner radius of cross-section = 2 cm

Inner curved surface area of pipe = $2\pi rh$ = $2 \times \dfrac{22}{7} \times 2 \times 77$ = 2 x 22 x 2 x 11 = 968 cm^2

(ii) Length of pipe = 77 cm, Outer diameter of pipe = 4.4 cm

$\Rightarrow$ Outer radius of the pipe = 2.2 cm

Outer surface area of the pipe = $2\pi rh$ = $2 \times \dfrac{22}{7} \times 2.2 \times 77$ = 44 x 2.2 x 11 = 1064.8 cm^2

(iii) Now there are two circles of radii 2 cm and 2.2 cm at both the ends of the pipe.

$\therefore$ Area of two edges of the pipe = 2 (Area of outer circle – area of inner circle)

$= 2\left(\pi R^2 - \pi r^2\right) = 2\pi\left(R^2 - r^2\right)$

$= 2 \times \dfrac{22}{7}\left[(2.2)^2 - (2)^2\right] = \dfrac{44}{7}(4.84 - 4)$

$= \dfrac{44}{7} \times 0.84$ = 5.28 cm^2

$\therefore$ Total surface area of pipe

= Inner curved surface area + Outer curved surface area + Area of two edges

= 968 + 1064.8 + 5.28 = 2038.08 cm^2

16. Inside diameter of the pipe = 24 cm

Outside diameter of the pipe = 28cm

Length of the pipe = 35cm = (h says)

Outside radius of the pipe = $\frac{28}{2}cm = 14cm = R(says)$

Volume of the wood = External volume – Internal volume

$$= \pi r^2 h - \pi^2 l$$
$$= \pi \times 35\left(14^2 - 12^2\right) cu\ cm$$
$$= \frac{22}{7} \times 35(14+12)(14-12) cu\ cm$$
$$= 5720 cu\ cm$$

Mass of 1cu cm = 0.6g

$\therefore$ Mass of the pipe = $(0.6 \times 5720)\,g$

= 3432g

= 3.432kg

17. The mean of 5 numbers = 39

$\therefore$ The sum of five numbers = $39 \times 5 = 195$

The mean of 4 numbers = 35

$\therefore$ The sum of four numbers = $35 \times 4 = 140$

Thus,

$\therefore$ The excluded numbers = Sum of five numbers – Sum of four numbers

= 195 – 140 = 55

18. (i) No. of tyres which covered distance less than 4000 km = 20

Total no. of tyres = 1000

Required probability $P(E) = \frac{20}{1000} = \frac{1}{50}$

(ii) No. of tyres needed to replaced more then 9000 km = 325+445=770

Required Probability = $\frac{770}{1000} = \frac{77}{100} = 0.77$

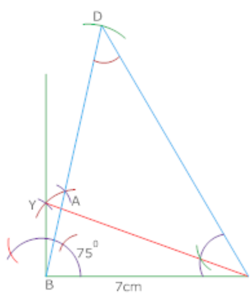
(iii) No. of tyres needed to replaced between 4000 km, to 14,000km.

$= 210 + 325 + 445 = 980$

Required probability $= \frac{980}{1000} = 0.98$

Section D

19. Steps of construction



(1) Draw BC = 7cm

(2) Draw $\angle DBC = 75°$

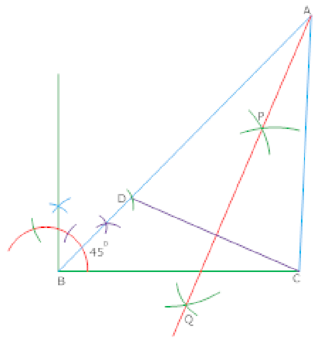
(3) Cut a line segment BD = 9cm

(4) Join DC and make $\angle DCY = \angle BDC$

(5) Let CY intersect BX at A

(6) Triangle ABC is required triangle

20. Steps of construction



(1) Draw line segment AB = 8cm

(2) Construct $\angle YBC = 45°$

(3) Taking B as a centre draw an arc of radius 3.5 cm which intersect at point D

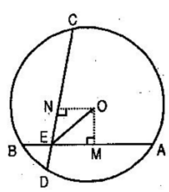
(4) Join DC

(5) Draw perpendicular bisector of DC which intersect BY at point A

(6) Join AC

(7) ΔABC is required triangle.

21. Given: Let AB and CD are two equal chords of a circle of centers



O intersecting each other at point E within the circle.
To prove: (a) AE = CE (b) BE = DE
Construction: Draw OM $\perp$ AB, ON $\perp$ CD. Also join OE.
Proof: In right triangles OME and ONE,

$\angle$OME = $\angle$ONE = 90°

OM = ON

[Equal chords are equidistance from the centre]

OE = OE [Common]

$\therefore$ Δ OME $\cong$ Δ ONE [RHS rule of congruency]

$\therefore$ ME = NE [By CPCT] ……….(i)

Now, O is the centre of circle and OM $\perp$ AB

$\therefore$ AM = $\frac{1}{2}$AB [Perpendicular from the centre bisects the chord] …..(ii)

Similarly, $NC = \frac{1}{2} CD$ ....(iii)

But $AB = CD$ [Given]

From eq. (ii) and (iii), $AM = NC$ ....(iv)

Also $MB = DN$ ....(v)

Adding (i) and (iv), we get,

$AM + ME = NC + NE$

$\Rightarrow$ $AE = CE$ [Proved part (a)]

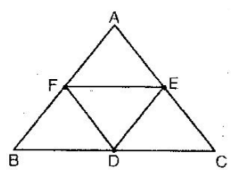
Now $AB = CD$ [Given]

$AE = CE$ [Proved]

$\Rightarrow$ $AB - AE = CD - CE$

$\Rightarrow$ $BE = DE$ [Proved part (b)]

22. (i) F is the mid-point of AB and E is the mid-point of AC.



$\therefore$ $FE \parallel BC$ and $FE = \frac{1}{2} BD$

[$\because$ Line joining the mid-points of two sides of a triangle is parallel to the third and half of it]

$\Rightarrow$ $FE \parallel BD$ [BD is the part of BC]

And $FE = BD$

Also, D is the mid-point of BC.

$\therefore$ $BD = \frac{1}{2} BC$

And $FE \parallel BC$ and $FE = BD$

Again E is the mid-point of AC and D is the mid-point of BC.

$\therefore$ $DE \parallel AB$ and $DE = \frac{1}{2} AB$

$\Rightarrow$ $DE \parallel AB$ [BF is the part of AB]

And $DE = BF$

Again F is the mid-point of AB.

$\therefore$ $BF = \frac{1}{2} AB$

But $DE = \frac{1}{2} AB$

$\therefore$ $DE = BF$

Now we have $FE \parallel BD$ and $DE \parallel BF$

And FE = BD and DE = BF

Therefore, BDEF is a parallelogram.

(ii) BDEF is a parallelogram.

$\therefore$ ar (Δ BDF) = ar (Δ DEF) ....(i) [diagonals of parallelogram divides it in two triangles of equal area]

DCEF is also parallelogram.

$\therefore$ ar (Δ DEF) = ar (Δ DEC) ....(ii)

Also, AEDF is also parallelogram.

$\therefore$ ar (Δ AFE) = ar (Δ DEF) ....(iii)

From eq. (i), (ii) and (iii),

ar (Δ DEF) = ar (Δ BDF) = ar (Δ DEC) = ar (Δ AFE) ....(iv)

Now, ar (Δ ABC) = ar (Δ DEF) + ar (Δ BDF) + ar (Δ DEC) + ar (Δ AFE) ....(v)

$\Rightarrow$ ar (Δ ABC) = ar (Δ DEF) + ar (Δ DEF) + ar (Δ DEF) + ar (Δ DEF) [Using (iv) & (v)]

$\Rightarrow$ ar (Δ ABC) = 4 x ar (Δ DEF)

$\Rightarrow$ ar (Δ DEF) = $\frac{1}{4}$ ar (Δ ABC)

(iii) ar (|| gm BDEF) = ar (Δ BDF) + ar (Δ DEF) = ar (Δ DEF) + ar (Δ DEF) [Using (iv)]

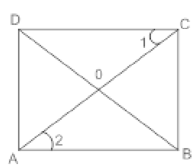
$\Rightarrow$ ar (|| gm BDEF) = 2 ar (Δ DEF)

$\Rightarrow$ ar (|| gm BDEF) = 2 x $\frac{1}{4}$ ar (Δ ABC)

$\Rightarrow$ ar (|| gm BDEF) = $\frac{1}{2}$ ar (Δ ABC)

23. Given in a quadrilateral ABCD, AC = BD, AO = OC and BO = OD and $\angle AOB = 90^0$

To prove: ABCD is a square.



Proof: $In\ \Delta AOB\ and\ \Delta COD$

$OA = OC$ $[given]$

$OB = OD$ $[given]$

and $\angle AOB = \angle COD$ $[vertically\ opposite\ angles]$

$\therefore$ $\Delta AOB \cong \Delta COD$ $[By\ SAS]$

$\therefore$ $AB = CD$ $[By\ CPCT]$

$\angle 1 = \angle 2$ $[By\ CPCT]$

But these are alternate angles therefore, $AB \| CD$

ABCD is a parallelogram whose diagonals bisects each other at right angles

Therefore, ABCD is a rhombus

Again in ΔABD and ΔBCA

AB = BC [Sides of a rhombus]

AD = AB [Sides of a rhombus]

and BD = CA [Given]

$\therefore \quad \Delta ABD \cong \Delta BCA$

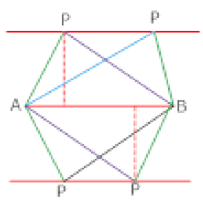
$\therefore \quad \angle BAD = \angle CBA \quad [By\ CPCT]$

These are alternate angles of these same side of transversal

$\therefore \quad \angle BAD + \angle CBA = 180^0 \ or\ \angle BAD = \angle CBA = 90^0$

Hence ABCD is a square

24. Let the perpendicular distance of P from AB be h



$ar(\Delta PAB) = K$

$\frac{1}{2} \times (AB) \times h = K$

$h = \frac{2K}{AB}$

Since AB and K are given h is a fixed Positive real number. This means that P lies on a line Parallel to AB at a distance h from it.

Hence, the locus of P is a pair of lines at a distance $h = \frac{2K}{AB}$, parallel to AB

25. Inner diameter of bowl = 10.5 cm

$\therefore$ Inner radius of bowl $(r) = \frac{10.5}{2}$ = 5.25 cm

Now, Inner surface area of bowl = $2\pi r^2$

= $2 \times \frac{22}{7} \times 5.25 \times 5.25$

$$= 2\times\frac{22}{7}\times\frac{21}{4}\times\frac{21}{4} = \frac{693}{4}\text{ cm}^2$$

$\because$ Cost of tin-plating per 100 cm^2 = Rs. 16

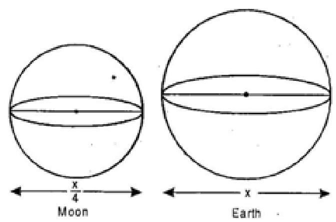
$\therefore$ Cost of tin-plating per 1 cm^2 = $\frac{16}{100}$

$\therefore$ Cost of tin-plating per $\frac{693}{4}$ cm^2 = $\frac{16}{100}\times\frac{693}{4}$ = Rs. 27.72

26. Let diameter of Earth = x

$\therefore$ Radius of Earth (r) = $\frac{x}{2}$

$\therefore$ Surface area of Earth = $4\pi r^2 = 4\pi\times\frac{x}{2}\times\frac{x}{2} = \pi x^2$



Now, Diameter of Moon = $\frac{1}{4}th$ of diameter of Earth = $\frac{x}{4}$

$\therefore$ Radius of Moon (r) = $\frac{x}{8}$

Surface area of Moon = $4\pi r^2 = 4\pi\times\frac{x}{8}\times\frac{x}{8} = \frac{\pi x^2}{16}$

Now, Ratio = $\frac{\text{Surface area of Moon}}{\text{Surface area of Earth}} = \frac{\frac{\pi x^2}{16}}{\pi x^2} = \frac{\pi x^2}{16}\times\frac{1}{\pi x^2} = \frac{1}{16}$

$\therefore$ Required ratio = 1 : 16

27. Since the given frequency distribution is the frequency distribution of 50 students. Therefore, g = 50

From the table, we have

a = 12, b + 12 = 25, 12 + b + 10 = c, 12 + b + 10 + d = 43,

12 + b + 10 + d + e = 48 and 12 + b + 10 + d + e + g = f

Now,

b + 12 = 25 $\Rightarrow$ b = 13

12 + b + 10 = c $\Rightarrow$ 12 + 13 + 10 = c [$\because$ b = 13]

$\Rightarrow$ c = 35

$12 + b + 10 + d = 43 \Rightarrow 12 + 13 + 10 + d = 43 \quad [\because b = 13]$

$\Rightarrow \quad d = 8$

$12 + b + 10 + d + e = 48 \Rightarrow 12 + 13 + 10 + 8 + e = 48 \quad [\because b=13, d= 8]$

$\Rightarrow \quad e = 5$

and $\quad 12 + b + 10 + d + e + 2 = f$

$\Rightarrow \quad 12 + 13 + 10 + 8 + 5 + 2 = f$

and $\quad f = 50$

Hence, $a = 12$,

$b = 13$,

$c = 35$,

$d = 8$,

$e = 5$,

$f = 50$

28. (a) No. of students = 39

$\therefore$ No. of trials = 39

(i) Number of students with weekly pocket expenses of Rs 59 = 10

$\therefore$ P (the weekly pocket expenses of a student are Rs 59) $= \dfrac{10}{39}$

(ii) No. of students with weekly pocket expenses of more than Rs 59 = 6+1=7

$\therefore$ P (the weekly pocket expenses of a student are more than Rs 59) $= \dfrac{7}{39}$

(iii) Number of students with weekly pocket expenses of less than Rs 59

$= 7 + 4 + 3 + 8 = 22$

$\therefore$ P (the weekly pocket expenses of a student are less than Rs 59) $= \dfrac{22}{39}$

(b) Sum of probabilities in (i),(ii), and (iii)

$$= \frac{10}{39} + \frac{7}{39} + \frac{22}{39} = \frac{39}{39} = 1$$