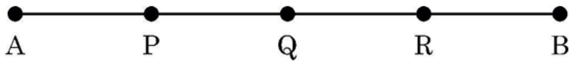
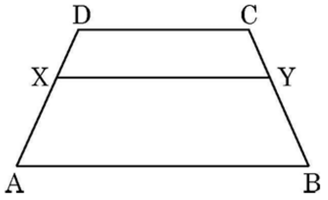
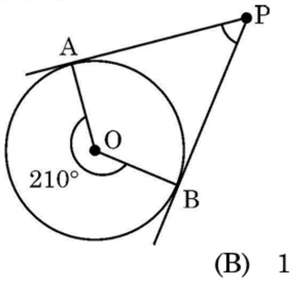
SOLUTIONS
MATHEMATICS (Subject Code–041) (PAPER CODE: 30/5/1)

Q. No.	**EXPECTED OUTCOMES/VALUE POINTS**	**Marks**
	SECTION A **This section consists of 20 multiple choice questions of 1 mark each.**	
1.	$\left(\sqrt{3}+2\right)^2+\left(\sqrt{3}-2\right)^2$ is a/an (A) positive rational number (B) negative rational number (C) positive irrational number (D) negative irrational number	
Sol.	(A) positive rational number	**1**
2.	Let $x = a^2 b^3 c^n$ and $y = a^3 b^m c^2$, where a, b, c are prime numbers. If LCM of x and y is $a^3 b^4 c^3$, then the value of m + n is (A) 10 (B) 7 (C) 6 (D) 5	
Sol.	(B) 7	**1**
3.	For any prime number p, if p divides a^2, where a is any real number then p also divides (A) a (B) $a^{\frac{1}{2}}$ (C) $a^{\frac{3}{2}}$ (D) $a^{\frac{1}{8}}$	
Sol.	(A) a	**1**
4.	Which of the following equations is a quadratic equation ? (A) $x^2 + 1 = (x - 1)^2$ (B) $\left(x+\sqrt{x}\right)^2 = 2x\sqrt{x}$ (C) $x^3 + 3x^2 = (x + 1)^3$ (D) $(x + 1)(x - 1) = (x + 1)^2$	
Sol.	(B) $\left(x+\sqrt{x}\right)^2 = 2x\sqrt{x}$	**1**
5.	If $x^2 + bx + b = 0$ has two real and distinct roots, then the value of b can be (A) 0 (B) 4 (C) 3 (D) –3	
Sol.	(D) – 3	**1**
6.	In the figure given below, points P, Q, R divides the line segment AB in four equal parts.  The point Q divides PB in the ratio (A) 1 : 3 (B) 2 : 3 (C) 1 : 2 (D) 1 : 1	
Sol.	(C) 1 : 2	**1**
7.	A bag contains red balls and black balls in the ratio 3 : 7. A ball is drawn at random. The probability that ball so drawn is black in colour, is (A) $\frac{3}{7}$ (B) 0.3 (C) 0.7 (D) $\frac{1}{7}$	
Sol.	(C) 0.7	**1**

8.	Which of the following statements is false ? (A) Two right triangles are always similar. (B) Two squares are always similar. (C) Two equilateral triangles are always similar. (D) Two circles are always similar.	
Sol.	(A) Two right triangles are always similar.	**1**
9.	In the adjoining figure, ABCD is a trapezium in which XY || AB || CD. If $AX = \frac{2}{3}AD$, then CY : YB =  (A) 2 : 3 (B) 3 : 2 (C) 1 : 3 (D) 1 : 2	
Sol.	(D) 1 : 2	**1**
10.	Which of the following statements is false ? (A) Infinite number of tangents can be drawn to a circle. (B) Infinite number of tangents can be drawn to a circle from a point outside the circle. (C) Infinite number of secants can be drawn to a circle from a point outside the circle. (D) Angle between tangent and diameter at point of contact is 90°.	
Sol.	(B) Infinite number of tangents can be drawn to a circle from a point outside the circle.	**1**
11.	In the adjoining figure, PA and PB are tangents to a circle with centre O. The measure of angle APB is  (A) 210° (B) 150° (C) 105° (D) 30°	
Sol.	(D) 30°	**1**
12.	$\frac{1 - \tan^2 30^\circ}{1 + \tan^2 30^\circ}$ is equal to (A) sin 60° (B) cos 60° (C) tan 60° (D) sec 60°	
Sol.	(B) cos 60°	**1**

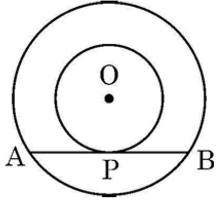
13. An observer 1.8 m tall stands away from a chimney at a distance of 38.2 m along the ground. The angle of elevation of top of chimney from the eyes of observer is 45°. The height of chimney above the ground is

(A) 38.2 m (B) 36.4 m

(C) 40 m (D) $(38.2)\sqrt{2}$ m

Sol. (C) 40 m **1**

14. In the adjoining figure, the sum of radii of two concentric circles is 16 cm. The length of chord AB which touches the inner circle at P is 16 cm. The difference of the radii of the given circles is



(A) 8 cm (B) 4 cm

(C) 2 cm (D) 3 cm

Sol. (B) 4 cm **1**

15. A cone of height 12 cm and slant height 13 cm is surmounted on a hemisphere having radius equal to that of cone. The entire height of the solid is

(A) 17 cm (B) 18 cm

(C) 22 cm (D) 23 cm

Sol. (A) 17 cm **1**

16. If x median + y mean = z mode; is the empirical relationship between mean, median and mode, then the value of x + y + z is

(A) 6 (B) 3

(C) 2 (D) 1

Sol. (C) 2 **1**

17. Following data shows the marks obtained by 100 students in a class test :

Marks obtained	20	29	28	33	42	38	43	25
Number of students	6	28	24	15	2	4	1	20

The median will be the average of which two observations ?

(A) 29 and 33 (B) 25 and 28

(C) 28 and 29 (D) 33 and 38

Sol. (C) 28 and 29 **1**

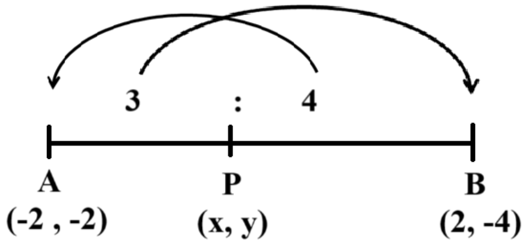
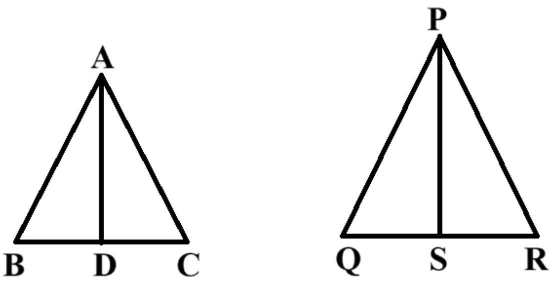
18. The probability of getting a composite number greater than 3 on throwing a die is

(A) $\frac{1}{6}$ (B) $\frac{1}{3}$

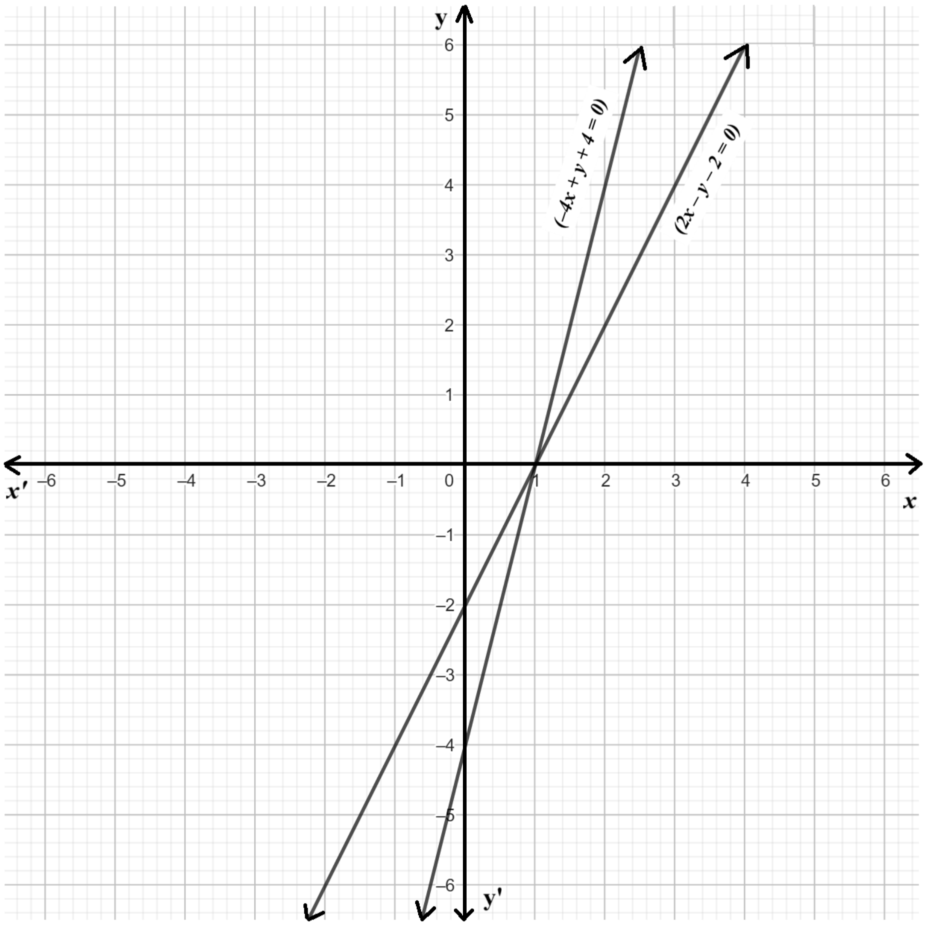
(C) $\frac{1}{2}$ (D) $\frac{2}{3}$

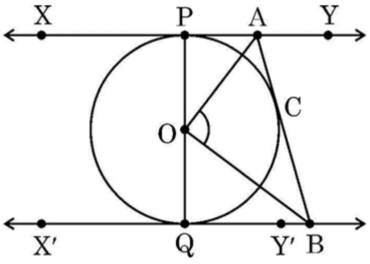
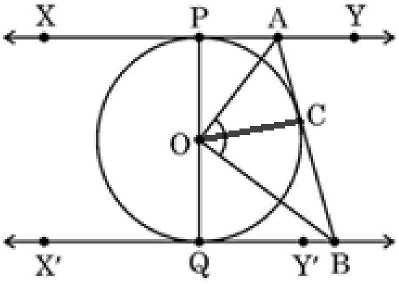
Sol. (B) $\frac{1}{3}$ **1**

	Directions : In Question Numbers **19** and **20**, a statement of **Assertion (A)** is followed by a statement of **Reason (R)**. Choose the correct option from following : (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of (A). (C) Assertion (A) is true, but Reason (R) is false. (D) Assertion (A) is false, but Reason (R) is true.	
19.	**Assertion (A) :** For an acute angle θ, $\sin\theta = \frac{3}{5} \Rightarrow \cos\theta = -\frac{4}{5}$. **Reason (R) :** For any value of θ, $(0^\circ \le \theta \le 90^\circ)$ $\sin^2\theta + \cos^2\theta = 1$.	
Sol.	(D) Assertion (A) is false, but Reason (R) is true.	**1**
20	**Assertion (A) :** For an A.P., 3,6,9, ..., 198, 10th term from the end is 168. **Reason (R) :** If 'a' and 'l' are the first term and last term of an A.P. with common difference 'd', then n^{th} term from the end of the given A.P. is $l - (n - 1)$ d.	
Sol.	(D) Assertion (A) is false, but Reason (R) is true.	**1**
	SECTION B **This section has 5 very short answer type questions of 2 marks each.**	
21 (a)	The cost of 2 kg apples and 1 kg of grapes on a day was found to be ₹ 320. The cost of 4 kg apples and 2 kg grapes was found to be ₹ 600. If cost of 1 kg of apples and 1 kg of grapes is ₹ x and ₹ y respectively, represent the given situation algebraically as a system of equations and check whether the system so obtained is consistent or not.	
Sol.	$2x + y = 320$ $4x + 2y = 600$ Here, $\frac{a_1}{a_2} = \frac{2}{4} = \frac{1}{2}, \frac{b_1}{b_2} = \frac{1}{2}, \frac{c_1}{c_2} = \frac{320}{600} = \frac{8}{15}$ As $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ ∴ System of equations is not consistent.	½ ½ ½ ½
	OR	
21 (b)	Solve for x and y : $\sqrt{2}\,x + \sqrt{3}\,y = 5$ and $\sqrt{3}\,x - \sqrt{8}\,y = -\sqrt{6}$	
Sol.	$(\sqrt{2}\,x + \sqrt{3}y = 5) \times \sqrt{3} \Longrightarrow \sqrt{6}\,x + 3y = 5\sqrt{3}$ $(\sqrt{3}\,x - \sqrt{8}y = -\sqrt{6}) \times \sqrt{2} \Longrightarrow \sqrt{6}\,x - 4y = -2\sqrt{3}$ Solving the equations, we get $x = \sqrt{2}$ and $y = \sqrt{3}$	½ ½ ½ + ½

22.	The coordinates of the end points of the line segment AB are A(–2, –2) and B(2, –4). P is the point on AB such that BP = $\frac{4}{7}$AB. Find the coordinates of point P.	
Sol.	 P (x, y) divides AB in the ratio 3: 4 $x = \frac{3 \times 2 + 4 \times(-2)}{4+3} \Longrightarrow x = -\frac{2}{7}$ $y = \frac{3 \times(-4) + 4 \times(-2)}{4+3} \Longrightarrow y = -\frac{20}{7}$ ∴ Coordinates of P are $\left(-\frac{2}{7}, -\frac{20}{7}\right)$	½ ½ ½ ½
23 (a)	It is given that sin (A – B) = sin A cos B – cos A sin B. Use it to find the value of sin 15°.	
Sol.	sin 15° = sin (45° – 30°) = sin 45° cos 30° – cos 45° sin 30° $= \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2} - \frac{1}{\sqrt{2}} \times \frac{1}{2}$ $= \frac{\sqrt{3}-1}{2\sqrt{2}}$ or $\frac{\sqrt{6}-\sqrt{2}}{4}$	½ **1** ½
	OR	
23 (b)	If sin A = y, then express cos A and tan A in terms of y.	
Sol.	$\cos A = \sqrt{1-\sin^2 A} = \sqrt{1-y^2}$ $\tan A = \frac{\sin A}{\cos A} = \frac{y}{\sqrt{1-y^2}}$	**1** **1**
24.	AD and PS are medians of triangles ABC and PQR respectively such that ΔABD ~ ΔPQS. Prove that ΔABC ~ ΔPQR.	
Sol.	Correct figure  Since Δ ABD ~ Δ PQS ∴ $\frac{AB}{PQ} = \frac{BD}{QS}$ or $\frac{AB}{PQ} = \frac{2BD}{2QS}$	½

	$\Rightarrow \frac{AB}{PQ} = \frac{BC}{QR}$ $\angle B = \angle Q$ $\therefore\ \Delta ABC \sim \Delta PQR$	½ ½ ½
25.	While shuffling a pack of 52 cards, one card was accidently dropped. Find the probability that the dropped card (i) is not a face card. (ii) is a black king.	
Sol.	(i) P (not a face card) = $\frac{40}{52}$ or $\frac{10}{13}$ (ii) P (black king) = $\frac{2}{52}$ or $\frac{1}{26}$	**1** **1**
	SECTION C **This section has 6 short answer type questions of 3 marks each.**	
26 (a)	Prove that $\sqrt{3}$ is an irrational number.	
Sol.	Let $\sqrt{3}$ be a rational number. $\therefore \sqrt{3} = \frac{p}{q}$, where $q \neq 0$ and let p & q be coprimes. $\Rightarrow 3q^2 = p^2$ $\Rightarrow p^2$ is divisible by 3. $\Rightarrow$ p is divisible by 3. ----- ① Let p = 3a, where ‘a’ is some integer $\therefore 9a^2 = 3q^2$ $\Rightarrow q^2 = 3a^2$ $\Rightarrow q^2$ is divisible by 3 $\Rightarrow$ q is divisible by 3 ----- ② $\therefore$ 3 divides both p & q. ① and ② leads to contradiction as p and q are coprimes. Hence, $\sqrt{3}$ is an irrational number.	½ **1** **1** ½
	OR	
26 (b)	State true or false for each of the following statements and justify in each case : (i) $2 \times 3 \times 5 \times 7 + 7$ is a composite number. (ii) $2 \times 3 \times 5 \times 7 + 1$ is a composite number.	
Sol.	(i) True, $\because 2 \times 3 \times 5 \times 7 + 7 = 7 \times (2 \times 3 \times 5 + 1)$ has more than two factors. (ii) False, $\because 2 \times 3 \times 5 \times 7 + 1 = 211$ has only two factors.	**1** ½ **1** ½
27.	Obtain the zeroes of the polynomial $7x^2 + 18x - 9$. Hence, write a polynomial each of whose zeroes is twice the zeroes of given polynomial.	
Sol.	$7x^2 + 18x - 9$ $= (7x - 3)(x + 3)$ $\therefore$ Zeroes are $-3, \frac{3}{7}$	**1**

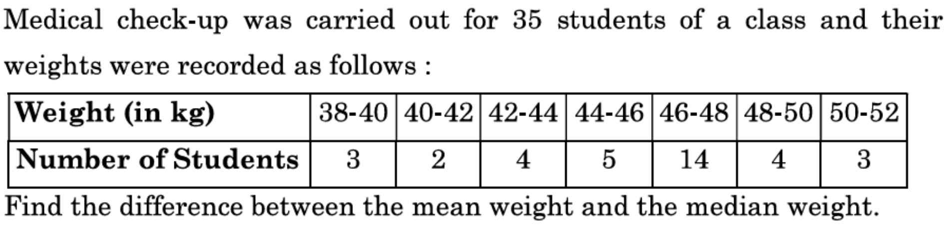
	New zeroes are – 6, $\frac{6}{7}$ Sum of new zeroes = (– 6) + $\frac{6}{7}$ = $-\frac{36}{7}$ Product of new zeroes = (– 6) $\times \frac{6}{7} = -\frac{36}{7}$ ∴ Required polynomial is $x^2 + \frac{36}{7}x - \frac{36}{7}$ or $7x^2 + 36x - 36$	½ ½ ½ ½
28.	Solve the following system of equations graphically : $2x - y - 2 = 0$ $-4x + y + 4 = 0$ Also, find the absolute difference between the ordinates of the points where given lines cut y – axis.	
Sol.	Correct graph  Solution is (1, 0) or $x = 1$, $y = 0$ Absolute difference = 2 (consider – 2 also)	**2** ½ ½
29.	Find a relation between x and y such that P(x, y) is equidistant from the points A(3, 5) and B(7, 1). Hence, write the coordinates of the points on x-axis and y-axis which are equidistant from points A and B.	
Sol.	PA = PB ⟹ $PA^2 = PB^2$ $(x-3)^2 + (y-5)^2 = (x-7)^2 + (y-1)^2$ ⟹ x – y = 2 ∴ Required point on x-axis is (2, 0) & required point on y-axis is (0, – 2)	½ **1** ½ ½ ½

30 (a)	Prove the following trigonometric identity : $\frac{1 + \text{cosec A}}{\text{cosec A}} = \frac{\cos^2 A}{1 - \sin A}$	
Sol.	LHS = $\frac{1 + \frac{1}{\sin A}}{\frac{1}{\sin A}}$ = sin A + 1 = $\frac{(\sin A + 1)(1 - \sin A)}{1 - \sin A}$ = $\frac{1 - \sin^2 A}{1 - \sin A}$ = $\frac{\cos^2 A}{1 - \sin A}$ = RHS	½ **1** ½ ½ ½
	OR	
30 (b)	Let 2A + B and A + 2B be acute angles such that $\sin(2A + B) = \frac{\sqrt{3}}{2}$ and tan(A + 2B) = 1. Find the value of cot(4A – 7B).	
Sol.	$\sin(2A + B) = \frac{\sqrt{3}}{2} \Longrightarrow 2A + B = 60°$ --- ① $\tan(A + 2B) = 1 \Longrightarrow A + 2B = 45°$ --- ② Solving ① & ②, we get A = 25° and B = 10° cot (4A – 7B) = cot 30° = $\sqrt{3}$	½ ½ ½ + ½ ½ ½
31.	In the adjoining figure, XY and $X'Y'$ are parallel tangents to a circle with centre O. Another tangent AB touches the circle at C intersecting XY at A and $X'Y'$ at B. Prove that AB subtends right angle at the centre of the circle; or ∠AOB = 90°.  	
Sol.	Join OC.  ΔPOA ≅ ΔCOA ∠POA = ∠COA Similarly, ∠QOB = ∠COB ∠POA + ∠QOB + ∠COA + ∠COB = 180°	½ ½ ½ ½ ½

	$\Rightarrow 2\,(\angle COA + \angle COB) = 180°$	
	$\Rightarrow \angle COA + \angle COB = 90°$	
	$\therefore\ \angle AOB = 90°$	½
	SECTION D **This section has 4 long answer questions of 5 marks each.**	
32 (a)	A 2-digit number is seven times the sum of its digits and two (2) more than 5 times the product of its digits. Find the number.	
Sol.	Let digit at unit place be x and digit at tens place be y $\therefore$ number = $10y + x$	**1**
	ATQ	
	$10y + x = 7\,(x + y)$	
	$\Rightarrow\quad 3y = 6x$ or $y = 2x$ --- ①	**1**
	Also, $10y + x = 5xy + 2$ --- ②	½
	from ① and ②, we get	
	$10x^2 - 21x + 2 = 0$	**1**
	$\Rightarrow\quad (x - 2)(10x - 1) = 0$	
	$\therefore x = 2$	½
	So, $y = 4$	½
	$\therefore$ Required number is 42.	½
	OR	
32 (b)	Find the value(s) of p for which the quadratic equation given as $(p + 4)\,x^2 - (p + 1)\,x + 1 = 0$ has real and equal roots. Also, find the roots of the equation(s) so obtained.	
Sol.	For real and equal roots, D = 0	½
	$\therefore\quad [-(p + 1)]^2 - 4\,(p + 4) = 0$	½
	$\Rightarrow p^2 - 2p - 15 = 0$	
	$\Rightarrow (p - 5)(p + 3) = 0$	**1**
	$\therefore p = 5\ ,\ -3$	**1**
	For p = 5,	
	$9x^2 - 6x + 1 = 0$	
	$\Rightarrow (3x - 1)\,(3x - 1) = 0$	
	$\therefore x = \frac{1}{3}, \frac{1}{3}$	**1**
	For p = – 3,	
	$x^2 + 2x + 1 = 0$	
	$\Rightarrow (x + 1)\,(x + 1) = 0$	
	$\therefore x = -1, -1$	**1**
	Hence roots are $\frac{1}{3}, \frac{1}{3}$ and – 1, – 1 for p = 5 and p = – 3 respectively.	

33.	If a line is drawn parallel to one side of a triangle intersecting the other two sides in distinct points then it divides the two sides in the same ratio. Prove it. Also, state the converse of the above statement.	
Sol.	Correct figure, given, to prove, construction Correct proof Correct statement of converse of given statement	**2** **2** **1**
34 (a)	From one of the faces of a solid wooden cube of side 14 cm, maximum number of hemispheres of diameter 1.4 cm are scooped out. Find the total number of hemispheres that can be scooped out. Also, find the total surface area of the remaining solid.	
Sol.	Total number of hemispheres = $\frac{14 \times 14}{1.4 \times 1.4}$ = 100 Total Surface Area of remaining solid = Surface Area of Cube + Curved Surface Area of 100 hemispheres – Area of 100 circles = $6 \times 14 \times 14 + 100 \times 2 \times \frac{22}{7} \times 0.7 \times 0.7 - 100 \times \frac{22}{7} \times 0.7 \times 0.7$ = 1330 ∴ Total surface area of remaining solid is 1330 cm^2.	**1** **1** **2** **1**
	OR	
34 (b)	From a solid cylinder of height 24 cm and radius 5 cm, two cones of height 12 cm and radius 5 cm are hollowed out. Find the volume and surface area of the remaining solid.	
Sol.	Volume of remaining solid = Volume of cylinder –Volume of two cones = $\frac{22}{7} \times 5 \times 5 \times 24 - 2 \times \frac{1}{3} \times \frac{22}{7} \times 5 \times 5 \times 12$ = $\frac{8800}{7}$ or 1257.14 cm^3 approx. $l = \sqrt{(12)^2 + (5)^2}$ = 13 cm Surface Area of remaining solid = Curved Surface Area of cylinder + Curved Surface Area of two cones = $2 \times \frac{22}{7} \times 5 \times 24 + 2 \times \frac{22}{7} \times 5 \times 13$ = $\frac{8140}{7}$ or 1162.85 cm^2 approx.	 **1** **1** **1** **1** **1**

35.



Medical check-up was carried out for 35 students of a class and their weights were recorded as follows :

Weight (in kg)	38-40	40-42	42-44	44-46	46-48	48-50	50-52
Number of Students	3	2	4	5	14	4	3

Find the difference between the mean weight and the median weight.

Sol.

Weight (in kg)	Number of Students (f_i)	x_i	$u_i = \frac{x_i - 45}{2}$	$f_i u_i$	cf
38 – 40	3	39	– 3	– 9	3
40 – 42	2	41	– 2	– 4	5
42 – 44	4	43	– 1	– 4	9
44 – 46	5	45 = a	0	0	14
46 – 48	14	47	1	14	28
48 – 50	4	49	2	8	32
50 – 52	3	51	3	9	35
Total	35			14	

Correct table **1½**

Mean = $45 + \frac{14}{35} \times 2$ **1**

= 45.8 **½**

∴ Mean weight is 45.8 kg

Median Class is 46 – 48 **½**

Median = $46 + \frac{\frac{35}{2} - 14}{14} \times 2$ **½**

= 46.5 **½**

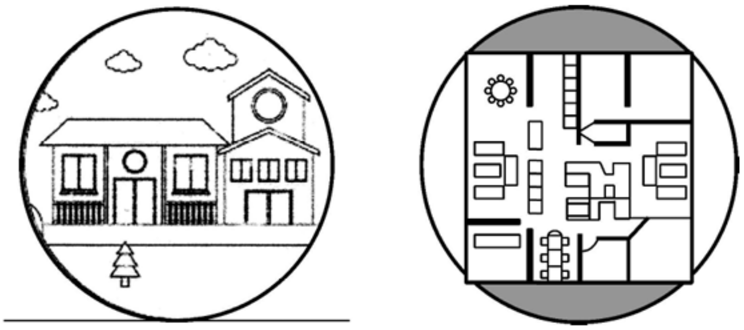
∴ Median weight is 46.5 kg

Difference of mean weight and median weight = 46.5 – 45.8 = 0.7 kg **½**

SECTION E

This section has 3 case study based questions of 4 marks each.

36. A farmer has a circular piece of land. He wishes to construct his house in the form of largest possible square within the land as shown below.



The radius of circular piece of land is 35 m.

Based on given information, answer the following questions :

(i) Find the length of wire needed to fence the entire land.

(ii) Find the length of each side of the square land on which house will be constructed.

(iii) (a) The farmer wishes to grow grass on the shaded region around the house. Find the cost of growing the grass at the rate of ₹ 50 per square metre.

OR

(iii) (b) Find the ratio of area of land on which house is built to remaining area of circular piece of land.

Sol.

(i) Length of wire = $2 \times \frac{22}{7} \times 35$ ½

$= 220$ m ½

(ii) Diagonal of square = 70 m ½

Length of each side of the square land = $\frac{70}{\sqrt{2}}$ or $35\sqrt{2}$ m ½

(iii) (a) Area on which grass is grown = Area of two segments

$$= 2 \times \left[\frac{90}{360} \times \frac{22}{7} \times 35 \times 35 - \frac{1}{2} \times 35 \times 35\right]$$ **1**

$= 700\ \text{m}^2$ ½

Cost of growing the grass = 700 × 50 = ₹ 35000 ½

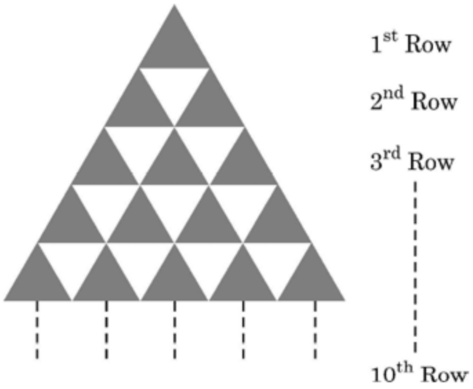
OR

(iii) (b) Required ratio = $\frac{\text{area of square}}{\text{area of circle} - \text{area of square}}$

$$= \frac{35\sqrt{2} \times 35\sqrt{2}}{\frac{22}{7} \times 35 \times 35 - 35\sqrt{2} \times 35\sqrt{2}}$$ **1½**

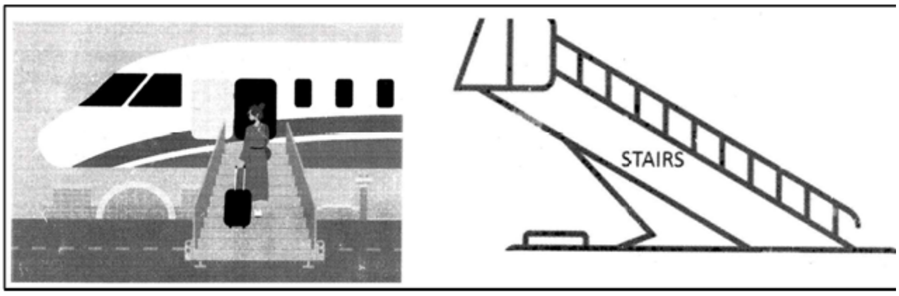
$= \frac{2450}{1400}$ or $\frac{7}{4}$ ½

∴ Required ratio is 7 : 4

37.	In an equilateral triangle of side 10 cm, equilateral triangles of side 1 cm are formed as shown in the figure below, such that there is one triangle in the first row, three triangles in the second row, five triangles in the third row and so on.  Based on given information, answer the following questions using Arithmetic Progression. (i) How many triangles will be there in bottom most row ? (ii) How many triangles will be there in fourth row from the bottom ? (iii) (a) Find the total number of triangles of side 1 cm each till 8th row. **OR** (iii) (b) How many more number of triangles are there from 5th row to 10th row than in first 4 rows ? Show working.	
Sol.	Given A.P. is 1, 3, 5, …	
	(i) $a_{10} = 1 + 9 \times 2 = 19$	**1**
	(ii) a_4 (from bottom) $= 19 + 3 \times (-2) = 13$	**1**
	(iii) (a) $S_8 = \frac{8}{2} \times [2 \times 1 + 7 \times 2]$	**1**
	$= 64$	**1**
	OR	
	(iii) (b) Number of triangles from 5th row to 10th row = $S_{10} - S_4$	
	$= \frac{10}{2} \times [2 \times 1 + 9 \times 2] - \frac{4}{2} \times [2 \times 1 + 3 \times 2]$	
	$= 84$	**1**
	Number of triangles in first 4 rows, $S_4 = \frac{4}{2} \times [2 \times 1 + 3 \times 2]$	
	$= 16$	½
	Required number of triangles = 84 – 16 = 68	½

38.

Passenger boarding stairs, sometimes referred to as boarding ramps, stair cars or aircraft steps, provide a mobile means to travel between the aircraft doors and the ground. Larger aircraft have door sills 5 to 20 feet (1 foot = 30 cm) high. Stairs facilitate safe boarding and de-boarding.



An aircraft has a door sill at a height of 15 feet above the ground. A stair car is placed at a horizontal distance of 15 feet from the plane.

Based on given information, answer the questions given in part (i) and (ii).

(i) Find the angle at which stairs are inclined to reach the door sill 15 feet high above the ground.

(ii) Find the length of stairs used to reach the door sill.

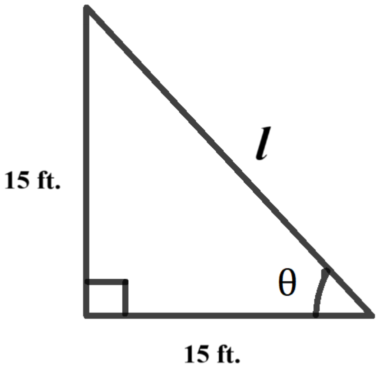
Further, answer any **one** of the following questions :

(iii) (a) If the 20 feet long stairs is inclined at an angle of 60° to reach the door sill, then find the height of the door sill above the ground. (use $\sqrt{3} = 1.732$)

OR

(iii) (b) What should be the shortest possible length of stairs to reach the door sill of the plane 20 feet above the ground, if the angle of elevation cannot exceed 30° ? Also, find the horizontal distance of base of stair car from the plane.

Sol.

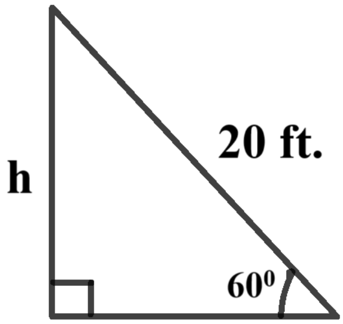
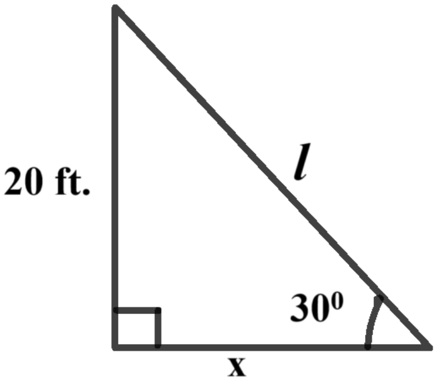


(i) $\tan \theta = \frac{15}{15} = 1$ ½

$\Rightarrow \theta = 45°$ ½

(ii) $\frac{15}{l} = \sin 45°$ ½

$\Rightarrow l = 15\sqrt{2}$ ft. or 21.21 ft. approx. ½

	(iii) (a)  	
	$\frac{h}{20} = \sin 60° = \frac{\sqrt{3}}{2}$	**1**
	$\Rightarrow h = 10\sqrt{3}$	½
	$= 10 \times 1.732$ $= 17.32$ ft.	½
	OR	
	(iii) (b)  	
	$\frac{20}{l} = \sin 30° = \frac{1}{2}$	½
	$\Rightarrow l = 40$ ft.	½
	$\frac{20}{x} = \tan 30° = \frac{1}{\sqrt{3}}$	½
	$\Rightarrow x = 20\sqrt{3}$ ft. or 34.64 ft. approx.	½