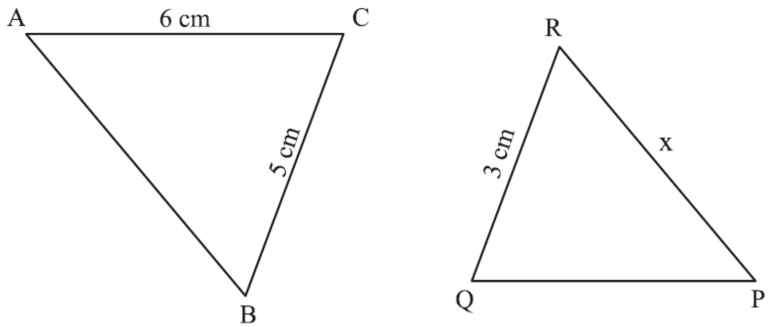
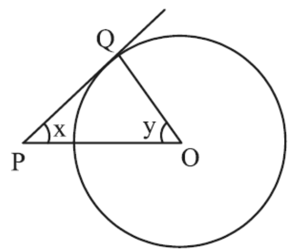
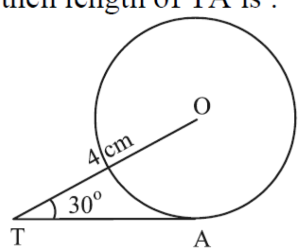
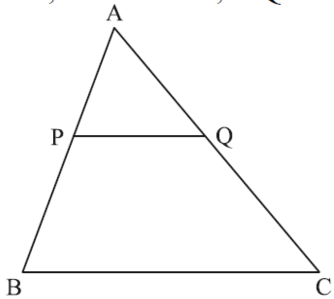
MARKING SCHEME
MATHEMATICS (Subject Code–041)
(PAPER CODE: 30/4/1)

Q. No.	EXPECTED OUTCOMES/VALUE POINTS	Marks
	SECTION A **Questions no. 1 to 18 are multiple choice questions (MCQs) and questions number 19 and 20 are Assertion-Reason based questions of 1 mark each**	
1.	The ratio of HCF to LCM of the least composite number and the least prime number is : (a) 1:2 (b) 2:1 (c) 1:1 (d) 1:3	
Sol.	(a) 1 : 2	**1**
2.	The roots of the equation $x^2 + 3x - 10 = 0$ are : (a) 2, –5 (b) –2, 5 (c) 2, 5 (d) –2, –5	
Sol.	(a) 2, – 5	**1**
3.	The next term of the A.P. : $\sqrt{6}$, $\sqrt{24}$, $\sqrt{54}$ is : (a) $\sqrt{60}$ (b) $\sqrt{96}$ (c) $\sqrt{72}$ (d) $\sqrt{216}$	
Sol.	(b) $\sqrt{96}$	**1**
4.	The distance of the point (–1, 7) from x-axis is : (a) –1 (b) 7 (c) 6 (d) $\sqrt{50}$	
Sol.	(b) 7	**1**
5.	What is the area of a semi-circle of diameter 'd' ? (a) $\frac{1}{16}\pi d^2$ (b) $\frac{1}{4}\pi d^2$ (c) $\frac{1}{8}\pi d^2$ (d) $\frac{1}{2}\pi d^2$	
Sol.	(c) $\frac{1}{8}\pi d^2$	**1**
6.	The empirical relation between the mode, median and mean of a distribution is : (a) Mode = 3 Median – 2 Mean (b) Mode = 3 Mean – 2 Median (c) Mode = 2 Median – 3 Mean (d) Mode = 2 Mean – 3 Median	

Sol.	(a) Mode = 3 Median – 2 Mean	**1**
7.	The pair of linear equations $2x = 5y + 6$ and $15y = 6x - 18$ represents two lines which are : (a) intersecting (b) parallel (c) coincident (d) either intersecting or parallel	
Sol.	(c) Coincident	**1**
8.	If α, β are zeroes of the polynomial x^2-1, then value of $(\alpha + \beta)$ is : (a) 2 (b) 1 (c) -1 (d) 0	
Sol.	(d) 0	**1**
9.	If a pole 6 m high casts a shadow $2\sqrt{3}$ m long on the ground, then sun's elevation is : (a) 60° (b) 45° (c) 30° (d) 90°	
Sol.	(a) 60°	**1**
10.	$\sec\theta$ when expressed in terms of $\cot\theta$, is equal to : (a) $\frac{1+\cot^2\theta}{\cot\theta}$ (b) $\sqrt{1+\cot^2\theta}$ (c) $\frac{\sqrt{1+\cot^2\theta}}{\cot\theta}$ (d) $\frac{\sqrt{1-\cot^2\theta}}{\cot\theta}$	
Sol.	(c) $\frac{\sqrt{1+\cot^2\theta}}{\cot\theta}$	**1**
11.	Two dice are thrown together. The probability of getting the difference of numbers on their upper faces equals to 3 is : (a) $\frac{1}{9}$ (b) $\frac{2}{9}$ (c) $\frac{1}{6}$ (d) $\frac{1}{12}$	
Sol.	(c) $\frac{1}{6}$	**1**

12.	 In the given figure, $\Delta ABC \sim \Delta QPR$. If AC = 6 cm, BC = 5 cm, QR = 3 cm and PR = x; then the value of x is : (a) 3.6 cm (b) 2.5 cm (c) 10 cm (d) 3.2 cm	
Sol.	(b) 2.5 cm	**1**
13.	The distance of the point (– 6, 8) from origin is : (a) 6 (b) – 6 (c) 8 (d) 10	
Sol.	(d) 10	**1**
14.	In the given figure, PQ is a tangent to the circle with centre O. If $\angle OPQ = x$, $\angle POQ = y$, then x + y is : (a) 45^{o} (b) 90^{o} (c) 60^{o} (d) 180^{o} 	
Sol.	(b) 90°	**1**
15.	In the given figure, TA is a tangent to the circle with centre O such that OT = 4 cm, $\angle OTA = 30^{o}$, then length of TA is : (a) $2\sqrt{3}$ cm (b) 2 cm (c) $2\sqrt{2}$ cm (d) $\sqrt{3}$ cm 	
Sol.	(a) $2\sqrt{3}$ cm	**1**

16.	In Δ ABC, PQ $\parallel$ BC. If PB = 6 cm, AP = 4 cm, AQ = 8 cm, find the length of AC. (a) 12 cm (b) 20 cm (c) 6 cm (d) 14 cm  	
Sol.	(b) 20 cm	**1**
17.	If α, β are the zeroes of the polynomial $p(x) = 4x^2 - 3x - 7$, then $\left(\frac{1}{\alpha} + \frac{1}{\beta}\right)$ is equal to : (a) $\frac{7}{3}$ (b) $\frac{-7}{3}$ (c) $\frac{3}{7}$ (d) $\frac{-3}{7}$	
Sol.	(d) $-\frac{3}{7}$	**1**
18.	A card is drawn at random from a well-shuffled pack of 52 cards. The probability that the card drawn is not an ace is : (a) $\frac{1}{13}$ (b) $\frac{9}{13}$ (c) $\frac{4}{13}$ (d) $\frac{12}{13}$	
Sol.	(d) $\frac{12}{13}$	**1**
	DIRECTIONS : In the question number **19** and **20**, a statement of **Assertion (A)** is followed by a statement of **Reason (R)**. Choose the correct option out of the following :	

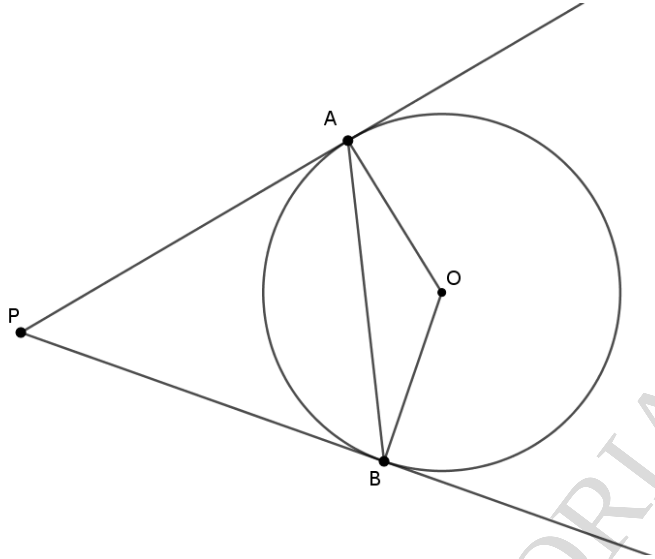
19.	**Assertion (A) :** The probability that a leap year has 53 Sundays is $\frac{2}{7}$. **Reason (R) :** The probability that a non-leap year has 53 Sundays is $\frac{5}{7}$. (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). (b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A). (c) Assertion (A) is true but Reason (R) is false. (d) Assertion (A) is false but Reason (R) is true.	
Sol.	(c) Assertion (A) is true but Reason (R) is false	**1**
20.	**Assertion (A) :** a, b, c are in A.P. if and only if 2b = a + c. **Reason (R) :** The sum of first n odd natural numbers is n^2. (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 and Reason (R) is not the correct explanation of Assertion (A). (c) Assertion (A) is true but Reason (R) is false. (d) Assertion (A) is false but Reason (R) is true.	
Sol.	(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A).	**1**
	SECTION B **This section comprises very short answer (VSA) type questions of 2 marks each.**	
21.	Two numbers are in the ratio 2 : 3 and their LCM is 180. What is the HCF of these numbers ?	
Sol.	Let the numbers be 2x, 3x LCM = 6x = 180 $\Rightarrow$ x = 30 $\therefore$ Numbers are 60, 90 HCF (60, 90) = 30	**1** **1**
22.	If one zero of the polynomial $p(x) = 6x^2 + 37x - (k - 2)$ is reciprocal of the other, then find the value of k.	

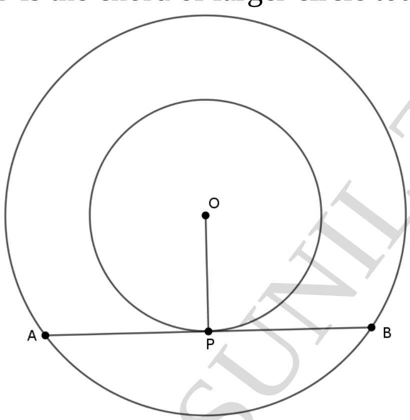
Sol.	$p(x) = 6x^2 + 37x - (k - 2)$ Let the zeroes be $\alpha, \frac{1}{\alpha}$ Product of zeroes $= \cancel{\alpha}\cdot\frac{1}{\cancel{\alpha}} = -\frac{(k-2)}{6}$ $6 = -k + 2 \Rightarrow k = -4$	$\frac{1}{2}$ 1 $\frac{1}{2}$
23(A).	Find the sum and product of the roots of the quadratic equation $2x^2 - 9x + 4 = 0$.	
Sol.	$2x^2 - 9x + 4 = 0$ $a = 2, b = -9, c = 4$ Let α, β be roots of $2x^2 - 9x + 4 = 0$ Sum $= \alpha + \beta = -\frac{b}{a} = \frac{9}{2}$ Product of roots $= \alpha\beta = \frac{c}{a} = \frac{4}{2} = 2$	1 1
	OR	
23(B).	Find the discriminant of the quadratic equation $4x^2 - 5 = 0$ and hence comment on the nature of roots of the equation.	
Sol.	$4x^2 - 5 = 0$ $a = 4, b = 0, c = -5$ Discriminant $= b^2 - 4ac = 0 - 4(4)(-5) = 80 > 0$ $\Rightarrow$ roots are real and distinct.	$1\frac{1}{2}$ $\frac{1}{2}$
24.	If a fair coin is tossed twice, find the probability of getting 'atmost one head'.	

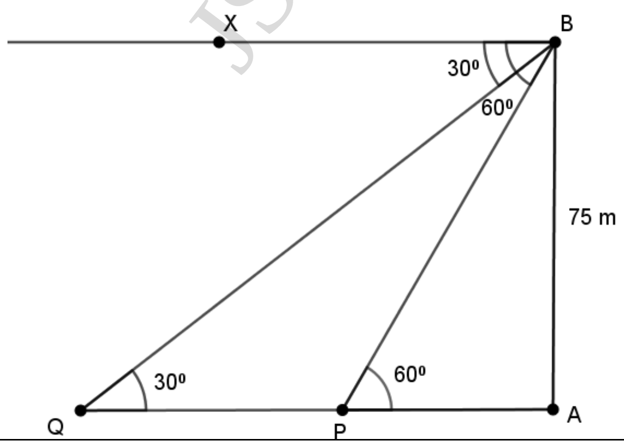
Sol.	Total outcomes are HH, HT, TH, TT Favourable outcomes are HT, TH, TT P (at most one head) = $\frac{3}{4}$	$\frac{1}{2}$ $\frac{1}{2}$ 1
25(A).	Evaluate $\frac{5\cos^2 60^\circ + 4\sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 30^\circ}$	
Sol.	$\frac{5\cos^2 60^\circ + 4\sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 30^\circ}$ $= \frac{5(1/2)^2 + 4(2/\sqrt{3})^2 - (1)^2}{1}$ $= \frac{5/4 + 16/3 - 1}{1} = \frac{67}{12}$	$1\frac{1}{2}$ $\frac{1}{2}$
	OR	
25(B).	If A and B are acute angles such that sin (A – B) = 0 and 2 cos (A + B) – 1 = 0, then find angles A and B.	
Sol.	sin (A – B) = 0 $\Rightarrow$ A – B = 0° cos (A + B) = $\frac{1}{2}$ $\Rightarrow$ A + B = 60° $\Rightarrow$ A = 30°, B = 30°	$\frac{1}{2}$ $\frac{1}{2}$ 1
	SECTION C **This section comprises of Short Answer (SA) type questions of 3 marks each.**	
26(A).	How many terms are there in an A.P. whose first and fifth terms are – 14 and 2, respectively and the last term is 62.	

Sol.	$a = -14,\ a_5 = 2 \quad \Rightarrow a + 4d = 2$ $-14 + 4d = 2 \Rightarrow d = 4$ $a_n = 62 \quad \Rightarrow a + (n-1)d = 62$ $-14 + (n-1)4 = 62 \quad \Rightarrow n = 20$	**1** **1** **1**
	OR	
26(B).	Which term of the A.P. : 65, 61, 57, 53, ... is the first negative term ?	
Sol.	65, 61, 57, 53, ... $a = 65,\ d = -4$ Let a_n be the first negative term $a_n < 0 \Rightarrow a + (n-1)d < 0$ $65 + (n-1)(-4) < 0 \Rightarrow \quad 69 - 4n < 0$ $n > \frac{69}{4}$ $\therefore$ Least positive integral value of n which satisfies $n > \frac{69}{4}$ is 18 $\therefore$ 1^{st} negative term of the AP = 18	$\frac{1}{2}$ **1** **1** $\frac{1}{2}$
27.	Prove that $\sqrt{5}$ is an irrational number.	
Sol.	Let $\sqrt{5}$ be a rational number. $\therefore \sqrt{5} = \frac{p}{q}$, where q≠0 and let p & q be co-primes. $5q^2 = p^2 \Longrightarrow p^2$ is divisible by 5 $\Longrightarrow$ p is divisible by 5 $\Longrightarrow p = 5a$, where 'a' is some integer ----- (i) $25a^2 = 5q^2 \Longrightarrow q^2 = 5a^2 \Longrightarrow q^2$ is divisible by 5 $\Longrightarrow$ q is divisible by 5 $\Longrightarrow q = 5b$, where 'b' is some integer ----- (ii) (i) and (ii) leads to contradiction as 'p' and 'q' are co-primes. $\therefore \sqrt{5}$ is an irrational number.	½ 1 ½ 1
28.	Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line-segment joining the points of contact at the centre.	

10

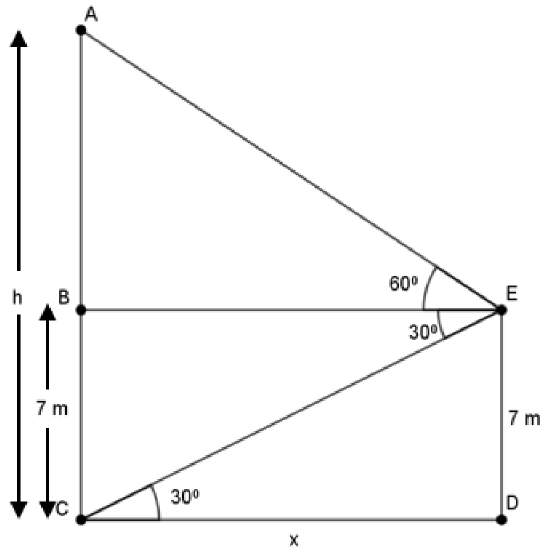
Sol.	PA and PB are tangents drawn from the external point P to the circle with centre O.  In quad. OAPB, $\angle OAP + \angle APB + \angle OBP + \angle AOB = 360°$ $90° + \angle APB + 90° + \angle AOB = 360°$ (Tangent $\perp$ radius) $\angle APB + \angle AOB = 360° - 180° = 180°$	**1 mark for correct figure** **1** $\mathbf{\frac{1}{2}}$ $\mathbf{\frac{1}{2}}$
29(A).	Prove that $\dfrac{\sin A - 2\sin^3 A}{2\cos^3 A - \cos A} = \tan A$	
Sol.	$\text{LHS} = \dfrac{\sin A - 2\sin^3 A}{2\cos^3 A - \cos A} = \dfrac{\sin A\,(1 - 2\sin^2 A)}{\cos A\,(2\cos^2 A - 1)}$ $= \dfrac{\sin A[1 - 2(1 - \cos^2 A)]}{\cos A[2\cos^2 A - 1]} = \dfrac{\sin A[1 - 2 + 2\cos^2 A]}{\cos A\,[2\cos^2 A - 1]}$ $= \dfrac{\sin A[2\cos^2 A - 1]}{\cos A\,[2\cos^2 A - 1]} = \tan A = \text{RHS}$	**1** **1** **1**

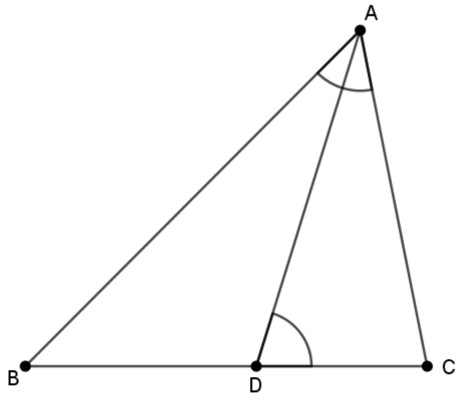
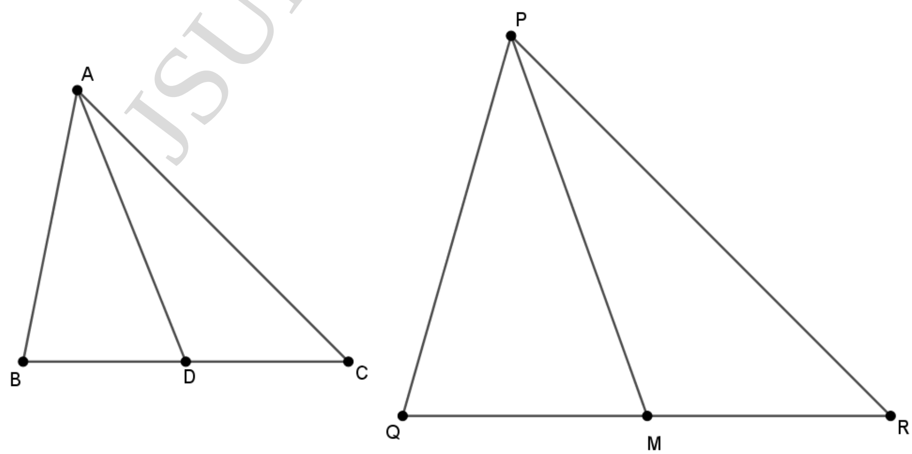
	OR	
29(B).	Prove that sec A (1 – sin A) (sec A + tan A) = 1.	
Sol.	LHS = sec A (1 – sin A) (sec A + tan A) $= \dfrac{1}{\cos A}(1 - \sin A)\left(\dfrac{1}{\cos A} + \dfrac{\sin A}{\cos A}\right)$ $= \dfrac{1}{\cos A}(1 - \sin A)\dfrac{(1 + \sin A)}{\cos A}$ $= \dfrac{1 - \sin^2 A}{\cos^2 A} = \dfrac{\cos^2 A}{\cos^2 A} = 1 = \text{RHS}$	 **1** **1** **1**
30.	Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.	
Sol.	AB is the chord of larger circle touching the smaller circle at P.  OA = 5 cm, OP = 3 cm To find AB OP ⊥ AB (radius ⊥ tangent) AB is the chord of larger circle and OP ⊥ AB ∴ AP = PB In right-angled Δ AOP, $AP^2 = 5^2 - 3^2 = 16$ AP = 4 cm	$\mathbf{\frac{1}{2}}$ **1** **1**

	$\therefore$ AB = 2AP = 8 cm	$\frac{1}{2}$
31.	Find the value of 'p' for which the quadratic equation px(x – 2) + 6 = 0 has two equal real roots.	
Sol.	$px(x-2)+6=0 \quad \Rightarrow px^2 - 2px + 6 = 0$ a = p, b = – 2p, c = 6 Quadratic equation has equal roots, $\therefore$ D = 0 $b^2 - 4ac = 0 \quad \Rightarrow 4p^2 - 24p = 0$ $4p(p-6)=0$ $p = 0, p = 6$ $p = 0$ rejected $\therefore p = 6$	$\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$ $\frac{1}{2}$
	SECTION D **This section comprises of Long Answer (LA) type questions of 5 marks each.**	
32(A).	A straight highway leads to the foot of a tower. A man standing on the top of the 75 m high tower observes two cars at angles of depression of 30° and 60°, which are approaching the foot of the tower. If one car is exactly behind the other on the same side of the tower, find the distance between the two cars. (use $\sqrt{3}$ = 1.73)	
Sol.	 	**1 mark for correct figure**

13

	AB = Height of tower = 75 m P, Q are positions of cars $\angle$ XBQ = $\angle$ BQA = 30° $\angle$ XBP = $\angle$ BPA = 60° In Δ APB, $\tan 60° = \frac{75}{AP} \Rightarrow AP = \frac{75}{\sqrt{3}} = 25\sqrt{3}$ In Δ AQB, $\tan 30° = \frac{75}{AQ} \Rightarrow AQ = 75\sqrt{3}$ Distance between the cars = PQ = AQ – AP $= 75\sqrt{3} - 25\sqrt{3} = 50\sqrt{3}$ $= 50 \times 1{\cdot}73 = 86{\cdot}5$ m	$1\frac{1}{2}$ $1\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
	OR	
32(B).	From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 30°. Determine the height of the tower.	

Sol.	 Let AC be h m, BC = DE = 7 m, AB = (h−7) m $\angle AEB = 60^\circ$ and $\angle BEC = 30^\circ$ $\therefore \angle ECD = 30^\circ$ Let CD be x m $\frac{DE}{CD} = \frac{7}{x} = \tan 30° \Rightarrow x = 7\sqrt{3}$ $\Rightarrow BE = 7\sqrt{3}$ Again $\frac{AB}{BE} = \tan 60^\circ$ $\Rightarrow \frac{h-7}{7\sqrt{3}} = \sqrt{3}$ $\Rightarrow h = 28$ $\therefore$ Height of tower = 28 m	**1 mark for correct figure** $\mathbf{1\frac{1}{2}}$ **1** **1** $\mathbf{\frac{1}{2}}$
33(A).	D is a point on the side BC of a triangle ABC such that $\angle$ADC = $\angle$BAC, prove that CA^2 = CB.CD	

Sol.	 In Δ ABC, D is a point on side BC such that ∠ ADC = ∠ BAC In Δ CBA and Δ CDA ∠ C = ∠ C (common) ∠ BAC = ∠ ADC (given) ∴ Δ CBA ~ Δ CAD (By AA similarity) ∴ their corresponding sides are proportional $\Rightarrow \frac{CB}{CA} = \frac{CA}{CD} \Rightarrow CA^2 = CB \cdot CD$	**1 mark for correct figure** 1 1 1 1
	OR	
33(B).	If AD and PM are medians of triangles ABC and PQR, respectively where ΔABC ~ ΔPQR, prove that $\frac{AB}{PQ} = \frac{AD}{PM}$.	
Sol.	 Δ ABC ~ Δ PQR	**1 mark for correct figure**

	AD and AM are medians of Δ ABC and Δ PQR respectively. Δ ABC ~ Δ PQR $\therefore \frac{AB}{PQ} = \frac{BC}{QR}$ $\frac{AB}{PQ} = \frac{2BD}{2QM}$ $\frac{AB}{PQ} = \frac{BD}{QM}$ Also $\angle B = \angle Q$ (Δ ABC ~ Δ PQR) ⇒ Δ ABD ~ Δ PQM (SAS similarly) $\Rightarrow \boldsymbol{\frac{AB}{PQ} = \frac{AD}{PM}}$	$1\frac{1}{2}$ $1\frac{1}{2}$ **1**
34.	A student was asked to make a model shaped like a cylinder with two cones attached to its ends by using a thin aluminium sheet. The diameter of the model is 3 cm and its total length is 12 cm. If each cone has a height of 2 cm, find the volume of air contained in the model.	
Sol.	Radius of each cone = Radius of cylinder = $\frac{3}{2}$ cm Height of each cone 'H' = 2 cm Height of cylinder 'h' = 12 – 4 = 8 cm Volume of air = Volume of cylinder + Volume of 2 cones $= \pi r^2 h + 2\frac{1}{3}\pi r^2 H$ $= \pi r^2\left(h + \frac{2}{3}H\right) = \frac{22}{7} \times \frac{3}{2} \times \frac{3}{2}\left(8 + \frac{2}{3} \times 2\right)$ $= \frac{22}{7} \times \frac{9}{4} \times \frac{28}{3} = 66\ cm^3$	**1** $1\frac{1}{2}+1\frac{1}{2}$ **1**

35. The monthly expenditure on milk in 200 families of a Housing Society is given below :

Monthly Expenditure (in ₹)	1000-1500	1500-2000	2000-2500	2500-3000	3000-3500	3500-4000	4000-4500	4500-5000
Number of families	24	40	33	x	30	22	16	7

Find the value of x and also, find the median and mean expenditure on milk.

Sol.

Monthly Exp. (in ₹)	x	f_i	c_f	d	$x_i f_i$
1000 – 1500	1250	24	24	– 3	– 72
1500 – 2000	1750	40	64	– 2	– 80
2000 – 2500	2250	33	97	– 1	– 33
2500 – 3000	2750	x=28	125	0	0
3000 – 3500	3250	30	155	1	30
3500 – 4000	3750	22	177	2	44
4000 – 4500	4250	16	193	3	48
4500 – 5000	4750	7	200	4	28
Total					– 35

2 for correct table

$172 + x = 200 \quad \Rightarrow x = 28$ **1**

l = lower limit of median class = 2500

$$\frac{N}{2} = \frac{200}{2} = 100$$

C = 97, f = 28, h = 500

18

$$\text{Median} = l + \frac{\frac{N}{2} - C}{f} \times h$$

$$= 2500 + \frac{100 - 97}{28} \times 500$$

$$= 2500 + \frac{3}{28} \times 500 = 2553 \cdot 6$$ **1**

Median Expenditure = ₹ 2553·6

$$\text{Mean} = 2750 - \frac{35 \times 500}{200} = 2750 - 87 \cdot 5 = 2662 \cdot 5$$ **1**

Mean Expenditure = ₹ 2662·5

SECTION E

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

36. Two schools 'P' and 'Q' decided to award prizes to their students for two games of Hockey ₹ x per student and Cricket ₹ y per student. School 'P' decided to award a total of ₹ 9,500 for the two games to 5 and 4 students respectively; while school 'Q' decided to award ₹ 7,370 for the two games to 4 and 3 students respectively.

Based on the above information, answer the following questions :

(i) Represent the following information algebraically (in terms of x and y).

(ii) (a) What is the prize amount for hockey ?

OR

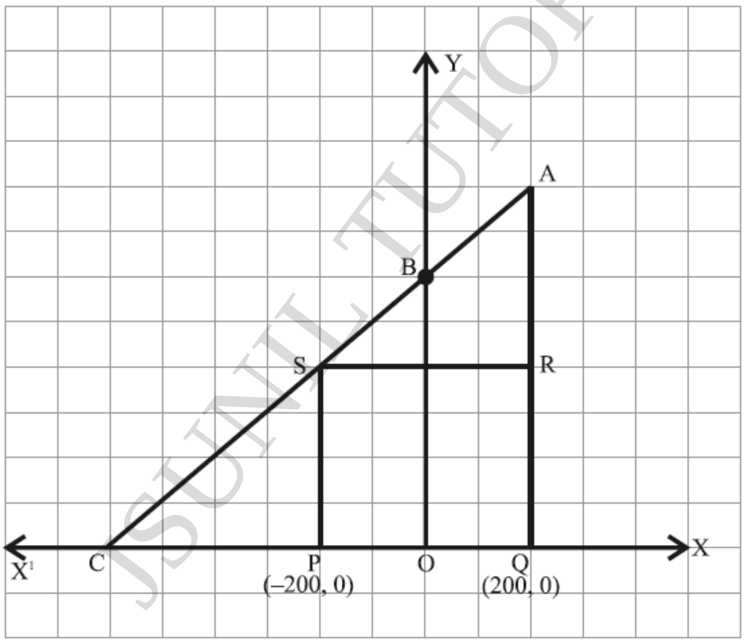
(b) Prize amount on which game is more and by how much ?

(iii) What will be the total prize amount if there are 2 students each from two games ?

Sol.

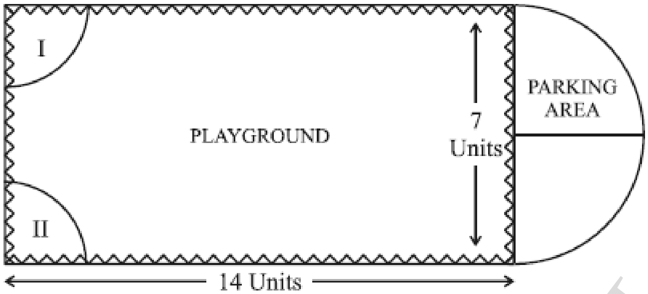
(i) $5x + 4y = 9500$ ____________ (1) $\frac{1}{2}$

$4x + 3y = 7370$ ____________ (2) $\frac{1}{2}$

	(ii) (a) Solving (1) and (2), $x = 980$ $\therefore$ Prize Amount for Hockey = ₹ 980	2
	OR	
	(ii) (b) On solving $x = 980$, $y = 1{,}150$	1
	$\therefore$ Prize Amount for Cricket is more by ₹ (1,150 – 980) = ₹ 170	1
	(iii) $2(x + y) = 2(980 + 1150) = 2(2130) =$ ₹ 4,260	1
37.	Jagdish has a field which is in the shape of a right angled triangle AQC. He wants to leave a space in the form of a square PQRS inside the field for growing wheat and the remaining for growing vegetables (as shown in the figure). In the field, there is a pole marked as O.  Based on the above information, answer the following questions : (i) Taking O as origin, coordinates of P are (–200, 0) and of Q are (200, 0). PQRS being a square, what are the coordinates of R and S ?	

	(ii) (a) What is the area of square PQRS ? **OR** (b) What is the length of diagonal PR in square PQRS ? (iii) If S divides CA in the ratio K:1, what is the value of K, where point A is (200, 800) ?	
Sol.	(i) R(200, 400), S(– 200, 400) (ii) (a) side PQ = (200+200) m = 400 m Area of square PQRS = 400 × 400 = 160000 sq. units **OR** (ii) (b) Diagonal PR = $\sqrt{(400)^2 + (400)^2}$ $= \sqrt{3200}$ or $400\sqrt{2}$ (iii) $C(-600,0); A(200,800); S(-200,400)$ S divides CA in the ratio $k:1$ $-200 = \frac{k(200)+1(-600)}{k+1}$ $\Rightarrow k = 1$	$\frac{1}{2}+\frac{1}{2}$ 1 1 1 1 1

38. Governing council of a local public development authority of Dehradun decided to build an adventurous playground on the top of a hill, which will have adequate space for parking.



After survey, it was decided to build rectangular playground, with a semi-circular area allotted for parking at one end of the playground. The length and breadth of the rectangular playground are 14 units and 7 units, respectively. There are two quadrants of radius 2 units on one side for special seats.

Based on the above information, answer the following questions :

(i) What is the total perimeter of the parking area ?

(ii) (a) What is the total area of parking and the two quadrants ?

OR

(b) What is the ratio of area of playground to the area of parking area ?

(iii) Find the cost of fencing the playground and parking area at the rate of ₹ 2 per unit.

Sol.

(i) Total perimeter = $\pi r + 2r$

$$= \frac{22}{7} \times \frac{7}{2} + 7 = 18 \text{ units}$$ **1**

(ii) (a) Area of parking $= \frac{1}{2}\pi r^2 = \frac{1}{2} \times \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} = \frac{77}{4}$ **1**

Area of quadrants $= 2 \cdot \frac{22}{7} \times 2 \times 2 \times \frac{1}{4} = \frac{44}{7}$ $\mathbf{\frac{1}{2}}$

Total Area $= \frac{77}{4} + \frac{44}{7} = \frac{715}{28}$ or 25·54 sq. units $\mathbf{\frac{1}{2}}$

	OR	
	(ii) (b) $\frac{\text{Area of playground}}{\text{Area of parking}} = \frac{98}{77/4} = \frac{56}{11} = 56:11$	**1+1**
	(iii) Required Perimeter = $2(l+b) + \frac{2\pi r}{2}$	
	$= 2(14+7) + \frac{22}{7} \times \frac{7}{2} = 53$ units	$\frac{1}{2}$
	Cost of fencing = $53 \times 2 =$ ₹ 106	$\frac{1}{2}$