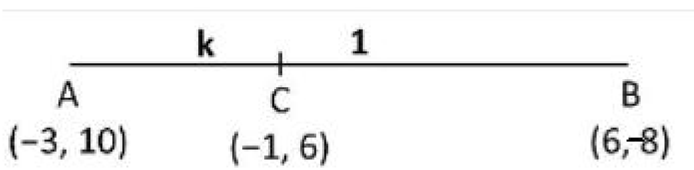
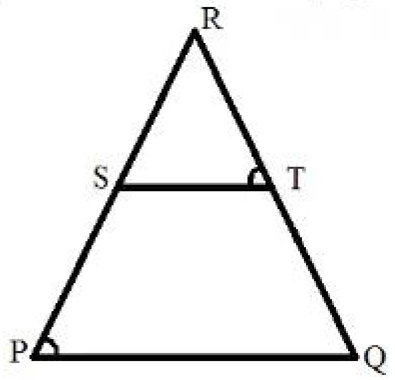
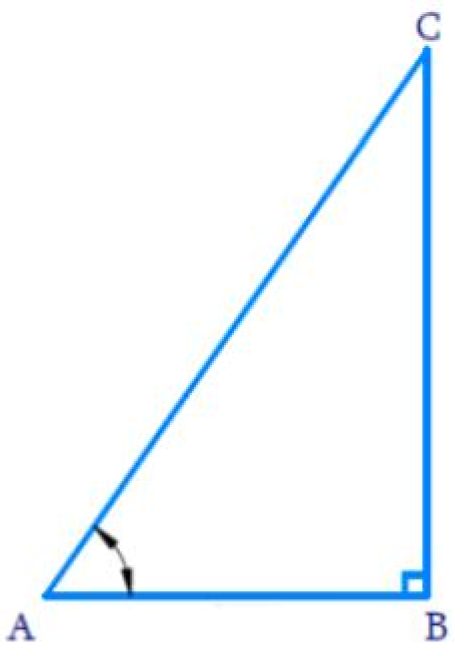
MARKING SCHEME BSEH PRACTICE PAPER 4,10TH MATHS(BASIC) MARCH 2024,(ENGLISH MEDIUM)		
Q. no.	**Expected solutions**	**marks**
	Section-A	
1	(c) a^3b^2	1
2	(a)13	1
3	(c)$\sqrt{4}$	1
4	(b) $\frac{4}{5}$	1
5	(c)$2x^2-7x+6=0$	1
6	(a)113	1
7	(b)$\sqrt{13}$	1
8	(b) 2cm	1
9	(a)3cm	1
10	4cm	1
11	secant	1
12	True	1
13	(d)$\tan^2 A$	1
14	(b) 45^0	1
15	(b)24m	1
16	$\frac{132}{7}$ cm^2	1
17	22 cm	1
18	(c) $\frac{1}{12}$	1
19	(d) Assertion(A) is false but Reason(R) is true.	1
20	(a)Both Assertion(A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion(A).	1
	SECTION-B	
21.	$px+3y-(p-3)=0$ .... (i) $12x+py-p=0$ ....(ii) For infinitely many solution $\frac{a_1}{a_2}=\frac{b_1}{b_2}=\frac{c_1}{c_2}$	1/2

	…………………………………………………………… $\Rightarrow \frac{p}{12} = \frac{3}{p} = \frac{-(p-3)}{-p}$ …………………………………………………………… From I and II $\frac{p}{12} = \frac{3}{p}$ $\Rightarrow p^2=36 \Rightarrow p^2-36=0 \Rightarrow p= \pm 6$ …………………………………………………………… From II and III $\frac{3}{p} = \frac{-(p-3)}{-p}$ $\Rightarrow 3= p-3 \Rightarrow p=6$ So, p=6	1/2 1/2 1/2
OR 21.	Given equations are x=2y-1......(i) 2x+3y=12............(ii) Substituting the value of x from (i) into (ii),we get 2(2y-1)+3y=12 …………………………………………………………… $\Rightarrow$ 4y-2+3y=12 …………………………………………………………… $\Rightarrow$ 7y=14$\Rightarrow$ y=2 …………………………………………………………… sustituting y=2 in eq (i),we get x=2(2)-1 $\Rightarrow$ x=3 Thus, x=3,y=2 is the required solution.	1/2 1/2 1/2 1/2
22.	 Let the ratio in which the line segment joining A(- 3, 10) and B(6, - 8) be divided by point C(- 1, 6) be k : 1.	

	By Section formula, , C(x, y) = $\left(\frac{mx_2+nx_1}{m+n}, \frac{my_2+ny_1}{m+n}\right)$ …………………………………………………………………… ⇒ (-1,6) = $\left(\frac{6k-3}{k+1}, \frac{-8k+10}{k+1}\right)$ …………………………………………………………………… m = k, n = 1 Therefore, $-1 = \frac{6k-3}{k+1}$ - k - 1 = 6k - 3 …………………………………………………………………… 7k = 2 k = 2 / 7 Hence, the point C divides line segment AB in the ratio 2 : 7.	1/2 1/2 1/2 1/2
23.	 …………………………………………………………………… In ΔRPQ and ΔRTS,	1/2

	∠RPQ = ∠RTS (given) .... ∠PRQ = ∠TRS (common angle) .... Thus, ΔRPQ ~ ΔRTS (AA criterion)	1/2 1/2 1/2
24.	sin(A - B) = 1/2 ⇒ Sin(A-B) = sin (30°) ⇒A - B = 30º …(1) .... cos (A + B) = 1/2 ⇒ cos(A + B) = cos (60º) ⇒ A + B = 60º …(2) .... On Adding Eq. (1) and (2), we get 2A = 90º ⇒ A = 45º .... Now, Putting the value of A in Eq.(2), we get 45º + B =60º ⇒ B = 15º Hence, A = 45º and B = 15⁰	1/2 1/2 1/2 1/2
OR 24	 	

	Let ΔABC be a right-angled triangle such that $\tan A = 1/\sqrt{3}$ $\tan A$ = side opposite to $\angle A$ / side adjacent to $\angle A$ = $BC/AB = 1/\sqrt{3}$ Let $BC = k$ and $AB = \sqrt{3}\, k$, where k is a positive integer.	1/2
	.... By applying Pythagoras theorem in ΔABC, we have $AC^2 = AB^2 + BC^2$ $= (\sqrt{3}\, k)^2 + (k)^2$ $= 3k^2 + k^2$ $= 4k^2$ $AC = 2k$	1/2
	.... Therefore, $\sin A$ = side opposite to $\angle A$ / hypotenuse = $BC/AC = 1/2$ $\cos A$ = side adjacent to $\angle A$ / hypotenuse = $AB/AC = \sqrt{3}/2$ $\sin C$ = side opposite to $\angle C$ / hypotenuse = $AB/AC = \sqrt{3}/2$ $\cos C$ = side adjacent to $\angle C$ / hypotenuse = $BC/AC = 1/2$	1/2
	.... By substituting the values of the trigonometric functions in the above equation we get, $\sin A \cos C + \cos A \sin C = (1/2)(1/2) + (\sqrt{3}/2)(\sqrt{3}/2)$ $= 1/4 + 3/4$ $= (1 + 3)/4$ $= 4/4$ $= 1$	1/2

25.	Area swept by the minute hand in 60 minutes $= \pi r^2$ Area swept by minute hand in 1 minute $= \pi r^2/60$ Thus, area swept by minute hand in 5 minutes $= (\pi r^2/60) \times 5 = \pi r^2/12$ .... Length of the minute hand (r) = 14 cm Therefore, the area swept by the minute hand in 5 minutes $= 5/60 \times \pi r^2 = 1/12\ \pi r^2$ .... $= 1/12 \times 22/7 \times 14 \times 14\ cm^2$ .... $= 154/3\ cm^2$	1/2 1/2 1/2 1/2
SECTION-C		
26.	**Prove that $\sqrt{3}$ is irrational**. **Solution:** Let, if possible, $\sqrt{3}$ be a rational no. --- $\therefore \sqrt{3} = \frac{p}{q}$, where p and q are co-prime integers and $q \neq 0$. --- $\Rightarrow 3 = \frac{p^2}{q^2}$ $\Rightarrow p^2 = 3q^2$ ....(i) $\Rightarrow$ 3 divides $p^2 \Rightarrow$ 3 divides p also. --- Let p = 3m,................................(ii) where m is any integer.	1/2 1/2 1/2

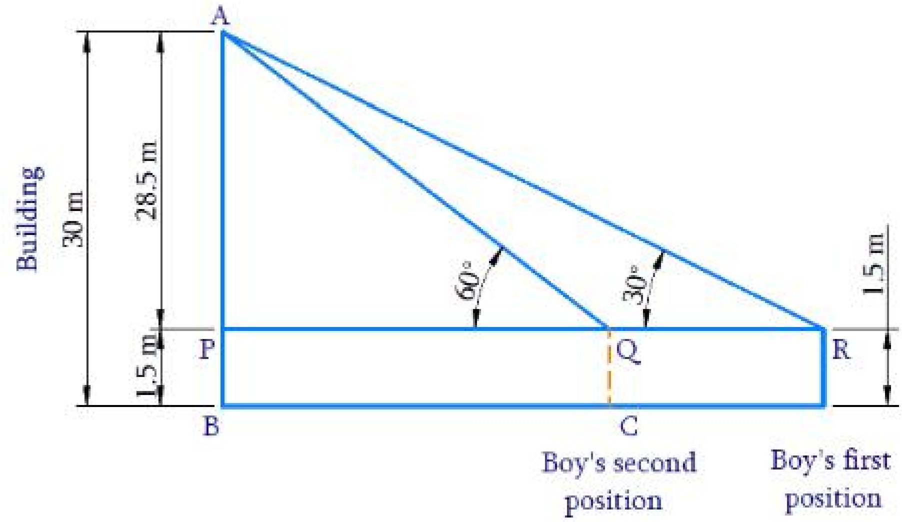
	$\Rightarrow p^2 = 9m^2$................................(iii) -- From (i) and (iii) $3q^2 = 9m^2$ $\Rightarrow q^2 = 3m^2$ $\Rightarrow$ 3 divides q^2 $\Rightarrow$ 3 divides q also. $\Rightarrow q = 3n$.....................................(iv) --- From (i) and (iv) , p and q have 3 as common factor. $\therefore$ p and q are not co-prime. Hence our supposition is wrong. $\therefore \sqrt{3}$ is an irrational number.	1/2 1/2 1/2
27.	Since one zero is 8 and the product of two zeroes is -56,the second zero is $\frac{-56}{8}$ = -7 .... so , a quadratic polynomial is $x^2 - \{8+(-7)\}x + 8(-7)$ .... $= x^2 + x - 56$	1 1 1
28.	Let unit's digit be y and ten's digit be x.Then number is 10x+y and number obtained on reversing the digits is 10y+x .... given $x + y = 9$........(i) .... and $9(10x+y) = 2(10y+x)$ $\Rightarrow 90x+9y=20y+2x$ $\Rightarrow 88x-11y=0 \Rightarrow 8x-y=0$............(ii) .... Adding (i) and (ii),we get $x + y + 8x - y = 9 + 0$ $\Rightarrow 9x = 9 \Rightarrow x = 1$	1/2 1/2 1/2 1/2

	.... Substituting the value of x in (i),we get y=8 .... Hence, the number is 18.	1/2 1/2
OR 28	Let the speed of car at A be x km/h and the speed of car at B be y km/h when the car travel in same direction Relative Speed is x−y Dist=100km t=5 hours ∴ Distance =Speed × Time .... 100=(x−y)5 x−y=20......................................(i) .... when car travel in opp direction Relative Speed is x+y Distance =100km t=1 hours Distance =Speed × $Time$ .... 100=(x+y)1 x+y=100...............................(ii) .... Solving (i) & (ii) x−y=20 x+y=100 2x=120 x=60km/h .... From equation(i), y=60−20 ∴ y=40km/h Speed of the car at A =60 km/h Speed of the car at B=40 km/h	1/2 1/2 1/2 1/2 1/2 1/2
29.	Let the point be (0 , y)	1/2

	So, $\sqrt{(6-0)^2+(5-y)^2} = \sqrt{(-4-0)^2+(3-y)^2}$	1/2
	....	
	On squaring both sides , we get $36+25+y^2-10y=16+9+y^2-6y$	1/2
	.... $61-10y=25-6y$ $10y-6y=61-25$	1/2
	.... $4y=36$ So, y = 9	1/2
	.... So, point = (0, 9)	1/2
30.	We use the following trigonometric identities: $\sec^2\theta=\tan^2\theta+1$	1/2
	.... and $\text{cosec}^2\theta=\cot^2\theta+1$	1/2
	.... On adding these, we get: $\sec^2\theta+\text{cosec}^2\theta=\tan^2\theta+\cot^2\theta+2$	1/2
	.... $\Rightarrow \sec^2\theta+\text{cosec}^2\theta = \tan^2\theta+\cot^2\theta+2\tan\theta\cot\theta$	1/2
	.... $\Rightarrow \sec^2\theta+\text{cosec}^2\theta = (\tan\theta+\cot\theta)^2$	1/2
	.... $\Rightarrow \sqrt{\sec^2\theta+\text{cosec}^2\theta} = \sqrt{(\tan\theta+\cot\theta)^2}$ $\Rightarrow \sec^2\theta+\text{cosec}^2\theta=\tan\theta+\cot\theta$ Hence Proved.	1/2
OR 30.	L.H.S. $= \dfrac{\cos A-\sin A+1}{\cos A+\sin A-1}$	

	$=\dfrac{\frac{\cos A-\sin A+1}{\sin A}}{\frac{\cos A+\sin A-1}{\sin A}}$ (Divide each term of Numerator and Denomenator by sin A)	1/2
	…………………………………………………………………………………	
	$=\dfrac{\cot A-1+\operatorname{cosec} A}{\cot A+1-\operatorname{cosec} A}$	1/2
	…………………………………………………………………………………………………	
	$=\dfrac{(\cot A+\operatorname{cosec} A)-1}{(\cot A-\operatorname{cosec} A)+1}$	
	$=\dfrac{(\cot A+\operatorname{cosec} A)-(\operatorname{cosec}^2 A-\cot^2 A)}{(\cot A-\operatorname{cosec} A+1)}$ $(\because \operatorname{cosec}^2 A-\cot^2 A=1)$	1
	…………………………………………………………………………………………………	
	$=\dfrac{(\operatorname{cosec} A+\cot A)(1-\operatorname{cosec} A+\cot A)}{(\cot A-\operatorname{cosec} A+1)}$	
	$=\operatorname{cosec} A+\cot A=$ R.H.S.	1

31.



1/2

....

In ΔAPR

tan R = AP/PR

tan 30° = 28.5/PR

$1/\sqrt{3} = 28.5/PR$

$PR = 28.5 \times \sqrt{3}$ m 1/2

....

In ΔAPQ

tan Q = AP/PQ

tan 60° = 28.5/PQ

$\sqrt{3} = 28.5/PQ$

$PQ = 28.5 / \sqrt{3}$ m 1/2

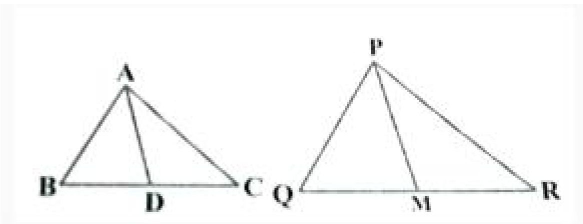
....

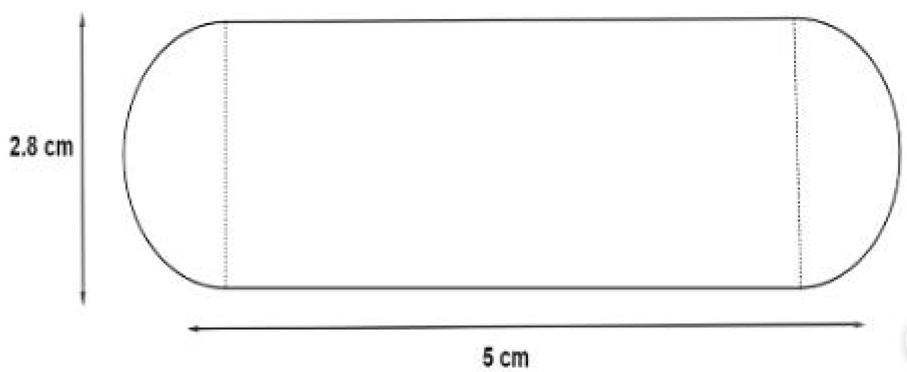
Therefore, Distance walked towards the building RQ = PR - PQ 1/2

....

$PR - PQ = 28.5\sqrt{3} - 28.5/\sqrt{3}$

	$= 28.5 (\sqrt{3} - 1/\sqrt{3})$ $= 28.5 ((3 - 1)/\sqrt{3})$ $= 28.5 (2/\sqrt{3})$ $= 57/\sqrt{3}$ .... $= (57 \times \sqrt{3})/(\sqrt{3} \times \sqrt{3})$ $= (57\sqrt{3})/3$ $= 19\sqrt{3}$ m The distance walked by the boy towards the building is $19\sqrt{3}$ m.	1/2 1/2
SECTION-D		
32.	Given, $a_4 + a_8 = 24$ $(a + 3d) + (a + 7d) = 24$ $\Rightarrow 2a + 10d = 24$ $\Rightarrow a + 5d = 12$ ....(1) .... Also, $a_6 + a_{10} = 44$ $(a + 5d) + (a + 9d) = 44$ $\Rightarrow 2a + 14d = 44$ $\Rightarrow a + 7d = 22$ ....(2)	1 1

	.... On subtracting equation (1) from (2), we obtain $(a + 7d) - (a + 5d) = 22 - 12$ $a + 7d - a - 5d = 10$ $2d = 10$ $d = 5$ .... By substituting the value of $d = 5$ in equation (1), we obtain $a + 5d = 12$ $a + 5 \times 5 = 12$ $a + 25 = 12$ $a = -13$ .... The first three terms are a, $(a + d)$ and $(a + 2d)$ Substituting the values of a and d , we get -13, $(-13 + 5)$ and $(-13 + 2 \times 5)$ The first three terms of this A.P. are -13, -8, and -3.	1 1 1
33.	 In ΔABC and ΔPQR $AB/PQ = BC/QR = AD/PM$ [given]	1/2

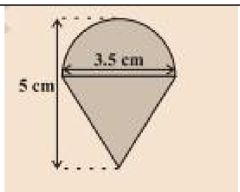
	AD and PM are median of ΔABC and ΔPQR respectively	
	⇒ BD/QM = (BC/2)/(QR/2) = BC/QR	1/2
	....	
	Now, in ΔABD and ΔPQM	
	AB/PQ = BD/QM = AD/PM	1
	⇒ ΔABD ~ ΔPQM [SSS criterion]	1
	....	
	Now, in ΔABC and ΔPQR	
	AB/PQ = BC/QR [given in the statement]	
	∠ABC = ∠PQR [∵ ΔABD ~ ΔPQM]	1
	⇒ ΔABC ~ ΔPQR [SAS criterion]	1
34.	 Diameter of the Gulab jamun, d = 2.8 cm Radius of cylindrical part = radius of hemispherical part r = d/2 = 2.8/2 cm	

	= 1.4 cm	
	Length of cylindrical part, h = 5 cm - 2 × 1.4 cm = 2.2 cm	1/2
	....	
	Volume of one Gulab jamun = volume of cylindrical part + 2 × volume of the hemispherical parts	1/2
	....	
	$= \pi r^2 h + 2 \times 2/3\ \pi r^3$	
	$= \pi r^2 h + 4/3\ \pi r^3$	
	$= \pi r^2\ (h + 4r/3)$	1
	....	
	= 22/7 × 1.4 cm × 1.4 cm × (2.2 cm + (4/3) × 1.4 cm)	
	= [22/7 × 1.4 cm × 1.4 cm × (12.2/3 cm)]	1/2
	....	
	$= 75.152/3\ cm^3$	1/2
	....	
	Volume of 45 Gulab jamuns = 45 × volume of one Gulab jamun	
	$= 45 \times 75.152/3\ cm^3$	
	$= 15 \times 75.152\ cm^3$	1/2
	....	
	$= 1127.28\ cm^3$	1/2
	....	
	Volume of sugar syrup in 45 Gulab jamuns = 30% of volume of 45 Gulab jamun	
	$= 30/100 \times 1127.28\ cm^3$	1/2
	....	

$= 338.184\ cm^3$ 1/2

Thus, the volume of sugar syrup in 45 cylindrical shaped gulab jamuns is 338 cm^3 (approximately).

OR
34.



The curved surface area of hemisphere
$=2\pi r^2$ 1/2

……………………………………………………………………………………

$=(2\times 22/7\times 3.5/2\times 3.5/2 cm^2)$ 1/2

……………………………………………………………………………………

The height of the cone = Height of the top – Height (radius) of the hemispherical part

$=(5-3.5/2)cm=3.25cm$ 1/2

……………………………………………………………………………………

So, the slant height of the cone (l)= $\sqrt{r^2+h^2}$= $\sqrt{(\frac{3.5}{2})^2+(3.25)^2}$
=3.7cm(approx) 1

……………………………………………………………………………………

Therefore, curved surface area of cone $=\pi rl$ 1/2

……………………………………………………………………………………

$=(22/7\times3.5/2\times3.7)\text{cm}^2$ 1/2

....

Total Surface area of the top = Curved surface area of hemisphere + Curved surface area of cone 1/2

....

$=(2\times22/7\times3.5/2\times3.5/2)+(22/7\times3.5/2\times3.7)$

$= 22/7\times3.5/2 \times (3.5+ 3.7) = \frac{11}{2} \times 7.2$ 1/2

....

$=39.6\ \text{cm}^2$ 1/2

35.

Class-Interval	Frequency	Cummulative Frequency
0-10	5	5
10-20	x	5+x
20-30	20	25+x
30-40	15	40+x
40-50	y	40+x+y
50-60	5	45+x+y

1

....

$\therefore 45 + x + y = 60$ 1/2

$\Rightarrow x + y = 15$ .....(i)

....

The median of the data is given as 28.5 which lies in interval 20 − 30.

Therefore, median class = 20 - 30 1/2

	n= 60 (given) ⇒ n/2 = 30	
	Class size, h = 10 Lower limit of median class, l = 20 Frequency of median class, f = 20	1/2
	Cumulative frequency of class preceding the median class, cf = 5 + x	1/2
	Median = l + $\left(\frac{\frac{n}{2}-cf}{f}\right) \times h$	1/2
	28.5 = 20 + $\left(\frac{\frac{60}{2}-(5+x)}{20}\right) \times 10$	1/2
	8.5 = (25 - x)/2 25 - x = 8.5 × 2 x = 25 - 17 x = 8	1/2
	Putting x = 8 in equation (i)	

	8 + y = 15 y = 7 Hence, the values of x and y are 8 and 7 respectively.	1/2
OR 35.		

Daily Expenditure (in ₹)	Class Mark (x_i)	No. of house-holds (f_i)	$u_i = \frac{x_i - a}{h}$	$f_i u_i$
100-150	125	4	-2	-8
150-200	175	5	-1	-5
200-250	225 =a	12	0	0
250-300	275	2	1	2
300-350	325	2	2	4
		$\sum f_i = 25$		$\sum f_i u_i = -7$

$\left[\frac{1}{2}\right]$ [1] $\left[\frac{1}{2}\right]$ [1]

3

....

We know that, Class mark, x_i = (Upper class limit + Lower class limit) / 2

Class size, h = 50

Taking assumed mean, a = 225
From the table, we obtain

1/2

$\Sigma f_i = 25$

$\Sigma f_i u_i = -7$

	.... Mean, $(x) = a + (\Sigma f_i u_i / \Sigma f_i) \times h$ .... $= 225 + (-7/25) \times 50$ $= 225 - 14$ .... $= 211$ Thus, the mean daily expenditure on food is ₹ 211.	1/2 1/2 1/2
	SECTION-E	
36.	(i) speed of stream= xkm/h Speed of motor boat =20km/h ∴ spees of motor boat upstream = (20-x)km/h	1
	(ii)speed = $\frac{\text{distance}}{\text{time}}$	1
	(iii)Time for upstream -Time for downstream = 1 hour $$\frac{15}{20-x} - \frac{15}{20+x} = 1$$ .... $\Rightarrow 300 + 15x - 300 + 15x = 400 - x^2$ $\Rightarrow x^2 + 30x - 400 = 0$ .... OR (iii) $x^2 + 30x - 400 = 0$ $\Rightarrow (x+40)(x-10) = 0$ .... $\Rightarrow x = 10$ or $x = -40$ ∴ speed of current = 10 km/h	1 1 1 1
37.	(i)Let, AD = AF = z cm . BD = BE = x cm . CF = CE = y cm . so, AB = z + x = 12 cm .	

	BC = x + y = 8 cm . CA = z + y = 10 cm . adding all, ⇒ AB + BC + CA = 12 + 8 + 10 ⇒ (z + x) + (x + y) + (z + y) = 30 ⇒ 2(x + y + z) = 30 ⇒ x + y + z = 15 cm . then, (i) ⇒ (x + y + z) - (x + y) = z ⇒ 15 - 8 = 7 cm = AD (Ans.1)	1
	(ii) (x + y + z) - (y + z) = x ⇒15 - 10 = 5 cm = BD	1
	(iii) (x + y + z) - (z + x) = y ⇒ 15 - 12 = 3 cm = CF .... now, given that, Radius of circle = OD = 4 cm. therefore,Area of ΔOAB = = $\frac{1}{2}$ × perpendicular height × Base $= \frac{1}{2} \times OD \times AB = \frac{1}{2} \times 4 \times 12 = 24$ cm²	1 1
	OR (iii) Area ΔABC = Area ΔOAB + Area ΔOBC + Area ΔOCA ⇒ Area ΔABC = [(1/2) × radius × AB] + [(1/2) × radius ×BC] + [(1/2) × radius × CA] ⇒ Area ΔABC = (1/2) × radius ×(AB + BC + CA) .... ⇒ Area ΔABC = (1/2) × 4 × 30 ⇒ Area ΔABC = 2 × 30	1

	⇒ Area ΔABC = 60 cm²	1

38.	(i)Number of possible outcomes=52 Number of favourable outcomes of getting a king of red colour=2 P(of getting a king of red colour) = $\frac{2}{52} = \frac{1}{26}$	1
	(ii) Number of possible outcomes=52 Number of favourable outcomes of getting a face card = 12 P(of getting a face card) = $\frac{12}{52} = \frac{3}{13}$	1
	(iii) Number of possible outcomes=52 Number of favourable outcomes of getting a jack of hearts =1 .... P(of getting a jack of hearts) = $\frac{1}{52}$	1 1
	OR (iii) Number of possible outcomes=52 Number of favourable outcomes of getting a red face card =6 .... P(of getting a red face card) = $\frac{6}{52} = \frac{3}{26}$	1 1