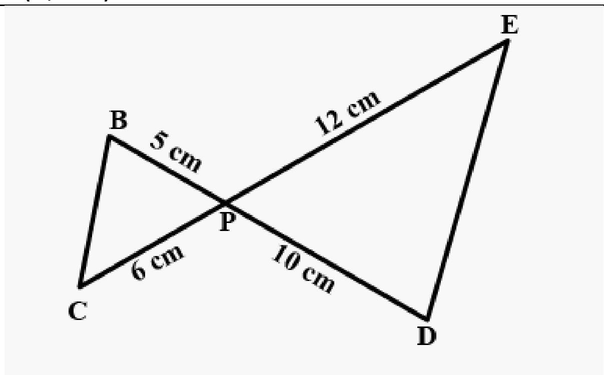
MARKING SCHEME BSEH Sample PAPER , 10^{TH} MATHS (BASIC) 2026-27 (ENGLISH MEDIUM)		
Q. no.	**Expected solutions**	**marks**
	Section-A	
1	(b) 150	1
2	(a) x^2+2x+5	1
3	(c)$(x+2)(x-1)=x^2-2x-3$	1
4	(c)3 units	1
5	(a) -12	1
6	(a) 50°	1
7	(d) 55°	1
8	(b) $\frac{b}{\sqrt{a^2+b^2}}$	1
9	(a)60^0	1
10	(b) $10\sqrt{2}$	1
11	(d) 3	1
12	(a) $\frac{1}{5}$	1
13	Irrational number	1
14	$\sqrt{119}$ cm	1
15	tanθ =a b	1
16	$\frac{1}{2}$	1
17	$\frac{77}{2}$ cm^2 or $\frac{49\pi}{4}$ cm^2	1
18	False	1
19	(a)Both Assertion(A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion(A).	1
20	(b) Both Assertion(A) and Reason (R) are true but Reason (R) is the not correct explanation of Assertion(A).	1
	SECTION-B	
21.(a)	$x/2 + 2y/3 = -1$ $3x + 4y = -6$ .... (i)	1/2

	…….. $x - y/3 = 3$ $3x – y = 9$ …………………………… (ii) …….. When the equation (ii) is subtracted from equation (i) we get, $5y = -15$ $y = -3$ …………………………………(iii) …….. When the equation (iii) is substituted in (i) we get, $3x – 12 = -6$ $3x = 6$ $x = 2$ Hence, $x = 2$, $y = -3$	1/2 1/2 1/2
21.(b)	Using the property of a rectangle, We know that, Lengths are equal, i.e., CD = AB Hence, $x + 3y = 13$ …(i) …….. Breadths are equal, i.e., AD = BC Hence, $3x + y = 7$ …(ii) …….. On multiplying Eq. (ii) by 3 and then subtracting Eq. (i), We get, $8x = 8$ So, $x = 1$ …….. On substituting $x = 1$ in Eq. (i), We get, $y = 4$ Therefore, the required values of x and y are 1 and 4, respectively.	1/2 1/2 1/2 1/2
22.	Let (– 4, 6) divide AB internally in the ratio k : 1.	

	Using the section formula, we get $(-4, 6) = (\frac{3k-6}{k+1}, \frac{-8k+10}{k+1})$ □…… □ □ □□ □ □ □ □ □ □ So, $-4 = \frac{3k-6}{k+1}$□ □……	1 1/2
	⇒ – 4k – 4 = 3k – 6 ⇒ 7k =2 ⇒, k : 1 = 2 : 7 We can check for the y-coordinate also. So, the point (– 4, 6) divides the line segment joining the points A(– 6, 10) and B(3, – 8) in the ratio 2 : 7.	1/2
23.	 In ΔPBC and ΔPDE, ∠BPC = ∠EPD [vertically opposite angles] PB/PD = 5/10 = ½ … (i) PC/PE = 6/12 = ½ … (ii) …… From equation (i) and (ii), We get, PB/PD = PC/PE Since, ∠BPC of ΔPBC = ∠EPD of ΔPDE and the sides including these. ……	1 1/2

	Then, by SAS similarity criteria ΔPBC ~ ΔPDE	1/2
24.(b)	We know that, $\cos 60° = 1/2$ $\sec 30° = 2/\sqrt{3}$ $\tan 45° = 1$ $\sin 30° = 1/2$ $\cos 30° = \sqrt{3}/2$ …… Now, substitute the values in the given problem, we get $(5\cos^2 60° + 4\sec^2 30° - \tan^2 45°)/(\sin^2 30° + \cos^2 30°)$ $= \{5(1/2)^2+4(2/\sqrt{3})^2-1\}/(1/2)^2+(\sqrt{3}/2)^2$ …… $= (5/4+16/3-1)/(1/4+3/4)$ $=\{ (15+64-12)/12\}/(4/4)$ …… $= 67/12$	1/2 1/2 1/2 1/2
24.(a)	LHS = $\sqrt{\frac{1+\sin A}{1-\sin A}}$ By rationalization $= \sqrt{\frac{1+sinA}{1-sinA} \times \frac{1+sinA}{1+sinA}}$ ……	1/2 1/2

	$=\frac{1+\sin A}{\sqrt{1-\sin^2 A}}$ …… $=\frac{1+\sin A}{\sqrt{\cos^2 A}}$ …… $=\frac{1+\sin A}{\cos A}$ = secA +tanA = RHS	 1/2 1/2
25.	Area swept by the minute hand in 60 minutes = Area of the circle with radius equal to the length of the minute hand = πr^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] …… $= 1/12 \times 22/7 \times 14 \times 14\ cm^2$ $= 154/3\ cm^2$	1/2 1/2 1/2 1/2

SECTION-C

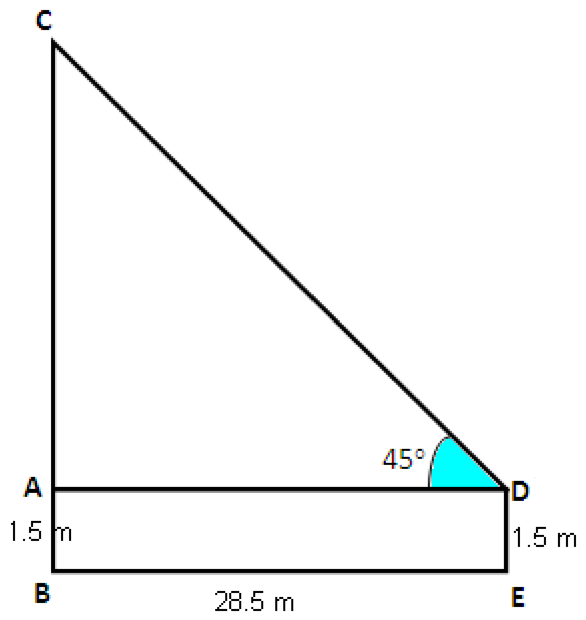
26.	मान लीजिए कि 3−2 $\sqrt{5}$ परिमेय संख्या है .... अतः इसे $\frac{a}{b}$ रूप में लिखा जा सकता है जहाँ a और b सह-अभाज्य हैं और b$\neq$ 0 अतः 3−2 $\sqrt{5}$ = $\frac{a}{b}$ .... $\Rightarrow 2\sqrt{5} = 3 - \frac{a}{b} = \frac{3b-a}{b}$ .... $\Rightarrow \sqrt{5} = \frac{3b-a}{2b}$ .... जहाँ $\sqrt{5}$ अपरिमेय है तथा $\frac{3b-a}{2b}$ परिमेय है । क्योंकि अपरिमेय संख्या$\neq$ परिमेय संख्या .... अतः उपरोक्त एक विरोधाभास है। इसलिए हमारी कल्पना ग़लत है. अतः 3−2 $\sqrt{5}$ अपरिमेय है।	
27.	$6x^2-3-7x=6x^2-7x-3=0$ $\Rightarrow 6x^2+2x-9x-3=0$ $\Rightarrow 2x(3x+1)-3(3x+1)=0$ $\Rightarrow (2x-3)(3x+1)=0$ Zeros = 3/2,−1/3 .... $\alpha+\beta=-b/a \Rightarrow (3/2)+(-1/3)=7/6=-(-7)6=-b/a$	1 1

	……………………………………………………………………… $\alpha\beta = c/a \Rightarrow (3/2)(-1/3) = -1/2 = -3/6 = c/a$ Hence proved.	1
28.(a)	Let Rahul's age be x years and his son's age be y years. ……………………………………………………………………… Five years hence(later), $x + 5 = 3(y + 5)$ $\Rightarrow x + 5 = 3y + 15$ $\Rightarrow x - 3y = 10$.......(1) ……………………………………………………………………… Also, five years ago(before), $x - 5 = 7(y - 5)$ $\Rightarrow x - 5 = 7y - 35$ $\Rightarrow x - 7y = -30$........(2) ……………………………………………………………………… Subtracting equation (2) from (1), $x - 3y - x + 7y = 10 + 30$ ($\because$eq.(2) changes its sign) $4y = 40$ $\Rightarrow y = 10$ ……………………………………………………………………… Put y = 10 in eq. (1),	1/2 1/2 1/2 1/2 1/2

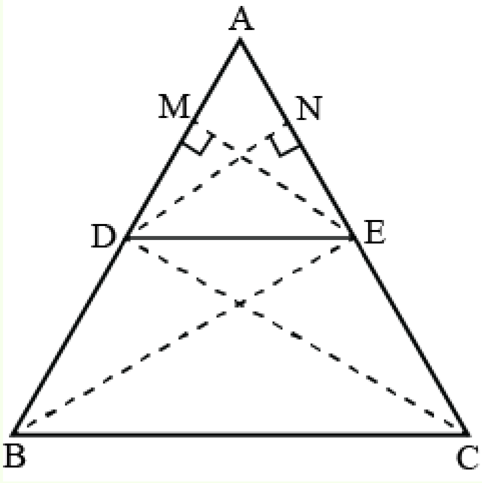
	x - 3(10) = 10 ⇒x - 30 = 10 ⇒x = 40 …… Thus, present age of Rahul=x=40 years and present age of Rahul's son=y=10 years.	1/2
28.(b)	Let the larger angle = x Smaller angle = y As both angles are supplementary, x + y = 180 ⇒ x = 180 - y .... (i) …… Difference is 18 degrees. So, x - y = 18 ⇒ x = 18 + y .... (i) …… Substituting the value of x in equation (i) we get, ⇒ 18 + y = 180 - y ⇒ - y - y = 18 - 180 ⇒ - 2y = -162 ⇒ y=−162/−2 ⇒ y = 81 …… Substituting the value of y in equation (i), we get, ⇒ x = 180 - 81 = 99 …… Hence, the angles are 99° and 81°.	1 1/2 1/2 1/2 1/2
29.	We know that the distance between the two points is given by the Distance Formula = $\sqrt{(x_2 - x_1)^2 \quad + (y_2 - y_1)^2}$ By substituting the values of points P (2, - 3) and Q (10, y) in the distance formula, we get ……	1/2

	PQ = $\sqrt{(2 - 10)^2 + (-3 - y)^2} = 10$ PQ = $\sqrt{(-8)^2 + (3 + y)^2} = 10$ ………………………………………………………………………………………………………	1/2
	Squaring on both sides, we get $64 + (y + 3)^2 = 100$ ………………………………………………………………………………………………………	1/2
	$(y + 3)^2 = 36$ $y + 3 = \sqrt{36}$ $y + 3 = \pm 6$ ………………………………………………………………………………………………………	1/2
	y + 3 = 6 or y + 3 = - 6 Therefore, y = 3 or - 9 are the possible values for y.	1
30.(a)	Given, $\cos A + \cos^2 A = 1$ $\Rightarrow \cos A = 1 - \cos^2 A$ $\Rightarrow \cos A = \sin^2 A$ [$\because$ $\sin^2 A = 1 - \cos^2 A$] ……………………….(i) ………………………………………………………………………………………………………	1
	LHS=$(\sin^2 A + \sin^4 A)$ = $(\sin^2 A + (\sin^2 A)^2)$ ………………………………………………………………………………………………………	1/2
	= $(\sin^2 A + (\cos A)^2)$ [using (i)] ………………………………………………………………………………………………………	1
	= $\sin^2 A + \cos^2 A$	1/2

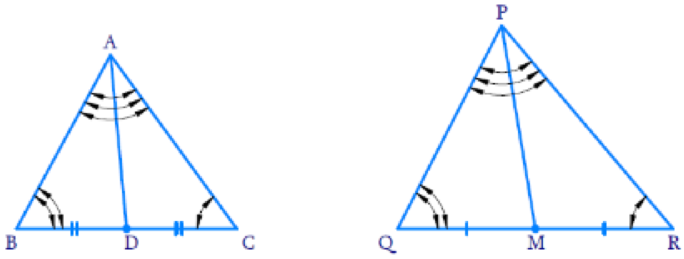
	$= 1 = RHS$	
30.(b)	$LHS=(\sin A+\mathrm{cosec}A)^2+(\cos A+\sec A)^2$ $=\sin^2A+\mathrm{cosec}^2A+2\sin A\,\mathrm{cosec}A+\cos^2A+\sec^2A+2\cos A\sec A$ …………………………………………………………………………………………… $=\sin^2A+\cos^2A+\mathrm{cosec}^2A+\sec^2A+2\sin A\times 1/\sin A+2\cos A\times 1/\cos A$ [$\because \mathrm{cosec}A=1/\sin A$ and $\sec A=1/\cos A$] …………………………………………………………………………………………… $=1+\mathrm{cosec}^2A+\sec^2A+2+2$ [$\because \sin^2A+\cos^2A=1$] …………………………………………………………………………………………… $=5+(1+\cot^2A)+(1+\tan^2A)$ [$\because 1+\tan^2A=\sec^2A$ and $1+\cot^2A=\mathrm{cosec}^2A$] $=7+\tan^2A+\cot^2A=$ RHS ……………………………………………………………………………………………	1/2 1 1/2 1

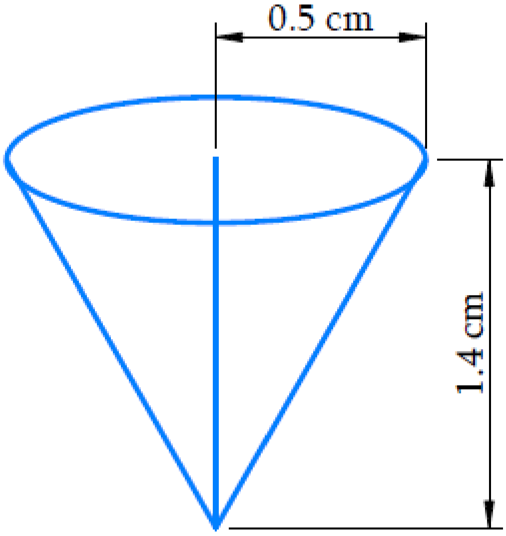
31.		1/2
	Given the height of the observer be DE = 1.5 m That is AB = 1.5 m Let BC = h is the height of the chimney Hence AC = (h – 1.5) m Given the distance between the observer and the chimney is AD = BE = 28.5 m	1/2
	In right $\triangle CAD, \theta=45^{o}$ $\tan 45^{o}=AC/AD$ $\Rightarrow 1=(h-1.5)/28.5$	1
	$\Rightarrow 28.5=h-1.5$ $\Rightarrow h=28.5+1.5= 30$ m Thus the height of the chimney is 30 m.	1
	SECTION-D	
32.(a)	Given, 2nd term, $a_2 = 14$ 3rd term, $a_3= 18$ Common difference, $d = a_3 - a_2 = 18 - 14 = 4$	1

	We know that nth term of an AP is, $a_n = a + (n - 1)d$ $a_2 = a + d$ $14 = a + 4$ $a = 10$ ……………………………………………………………………………………………… Sum of n terms of AP is given by $S_n = n/2\,[2a + (n - 1)\,d]$ ……………………………………………………………………………………………… $S_{51} = 51/2\,[2 \times 10 + (51 - 1)\,4]$ ……………………………………………………………………………………………… $= 51/2\,[20 + 50 \times 4]$ $= 51/2 \times 220$ $= 51 \times 110$ $= 5610$	1 1 1 1
32.(b)	nth term of an AP $a_n = a + (n - 1)d$ Let a be the first term and d the common difference. ……………………………………………………………………………………………… According to the question, $a_3 = 16$ and $a_7 - a_5 = 12$ $a + (3 - 1)d = 16$ $a + 2d = 16$ .... (1) ……………………………………………………………………………………………… Using $a_7 - a_5 = 12$ $[a + (7 - 1)\,d] - [a + (5 - 1)\,d] = 12$ $[a + 6d] - [a + 4d] = 12$ $2d = 12$ $d = 6$ ……………………………………………………………………………………………… By substituting this in equation (1), we obtain $a + 2 \times 6 = 16$ $a + 12 = 16$ $a = 4$ ………………………………………………………………………………………………	1/2 1 $1\frac{1}{2}$ 1

	Therefore, A.P. will be 4, 4 + 6, 4 + 2 × 6, 4 + 3 × 6, ... Hence, the sequence will be 4, 10, 16, 22, ...	1
33.(a)	**<u>Statement:Basic Proportionality Theorem</u>** Prove that if a line is drawn parallel to one side of a triangle ,the other two sides are divided in the same ratio. …..…………………………………………………………………………….. **Given:** In ΔABC, DE‖BC . . . .  . . . . To prove: $\frac{AD}{DB} = \frac{AE}{EC}$ ____	1 1/2 1/2 1/2

	------------------ **Construction :** Draw EM⊥AB and DN⊥AC. Join B to E and C to D -- **Proof**: In ΔADE and ΔBD $$\frac{\textbf{Area of}\Delta\textbf{ADE}}{\textbf{Area of }\Delta\textbf{BDE}} = \frac{\frac{1}{2}\times AD\times EM}{\frac{1}{2}\times DB\times EM} = \frac{AD}{DB} \text{--------------(i)}$$ -- In ΔADE and ΔCDE $$\frac{\textbf{Area of}\Delta\textbf{ADE}}{\textbf{Area of }\Delta\textbf{CDE}} = \frac{\frac{1}{2}\times AE\times DN}{\frac{1}{2}\times EC\times DN} = \frac{AE}{EC} \qquad \text{--------------(ii)}$$ -- Since, DE||BC [Given] ∴ ar(ΔBDE) = ar(ΔCDE) ----------------------------------- (iii) [Δs on the same base and between the same parallel sides are equal in area] -- From eq. (i), (ii) and (iii) : $\frac{AD}{DB} = \frac{AE}{EC}$ Hence proved.	1/2 1/2 1/2 1/2 1/2	

33.(b)	 .... Given, ΔABC ~ ΔPQR ⇒ ∠ABC = ∠PQR (corresponding angles) --------- (1) ⇒ AB/PQ = BC/QR (corresponding sides) .... ⇒ AB/PQ = (BC/2) / (QR/2) ⇒ AB/PQ = BD/QM (D and M are mid-points of BC and QR) ------------ (2) .... In ΔABD and ΔPQM, ∠ABD = ∠PQM (from 1) AB/PQ = BD/QM (from 2) ⇒ ΔABD ~ ΔPQM (SAS criterion) .... ⇒ AB/PQ = BD/QM = AD/PM (corresponding sides) ⇒ AB/PQ = AD/PM Hence proved.	1/2 1 1 $1\frac{1}{2}$ 1

34.(a)		
	Depth of each conical depression, $h_1 = 1.4$ cm Radius of each conical depression, $r = 0.5$ cm Dimensions of the cuboid are 15 cm × 10 cm × 3.5 cm	1
	……………………………………………………………………………………………………….	
	Volume of wood in the entire pen stand = volume of the wooden cuboid - 4 × volume of the conical depression	1
	……………………………………………………………………………………………………….	
		1
	$= l \times b \times h - 4 \times 1/3\, \pi r^2 h_1$	
	……………………………………………………………………………………………………….	
		1
	$= (15\text{ cm} \times 10\text{ cm} \times 3.5\text{ cm}) - (4 \times 1/3 \times 22/7 \times 0.5\text{ cm} \times 0.5\text{ cm} \times 1.4\text{ cm})$	
		1
	……………………………………………………………………………………………………….	
	$= 525\text{ cm}^3 - 1.47\text{ cm}^3$	

	$= 523.53\ cm^3$ The volume of wood in the entire stand is $523.53\ cm^3$.	
34.(b)	The total surface area of the cube $=6\times(\text{edge})^2=6\times5\times5\ cm^2=150\ cm^2$. ……………………………………………………………………………… The surface area of the block = Total Surface Area of cube - base area of hemisphere + Curved Surface Area of hemisphere ……………………………………………………………………………… $=150-\pi r^2+2\pi r^2$ $=(150+\pi r^2)\ cm^2$, ……………………………………………………………………………… $=150\ cm^2+(22/7\times4.2/2\times4.2/2)\ cm^2$ $=(150+13.86)\ cm^2$ ……………………………………………………………………………… $=163.86\ cm^2$	1 1 1 1 1
35.(a)	(table below) ……………………………………………………………………………… $\text{Mean} = \bar{x} = \frac{\sum f_i x_i}{\sum f_i}$ ……………………………………………………………………………… $\Rightarrow 18 = \frac{752+20f}{44+f}$	1+1 1/2 1/2

class interval	class-mark (x_i)	Number of children (f_i)	$f_i x_i$
11-13	12	7	84
13-15	14	6	84
15-17	16	9	144
17-19	18	13	234
19-21	20	f	20f
21-23	22	5	110
23-25	24	4	96
		$\sum f_i = 44+f$	$\sum f_i x_i = 752+20f$

	.... $\Rightarrow 18(44+f) = 752+20f$ $\Rightarrow 792 + 18f = 752 + 20f$ .... $\Rightarrow 792-752 = 20f - 18f$ .... $\Rightarrow 40 = 2f$ $\Rightarrow f = 20$ Hence, missing frequency f =20	1/2 1/2 1
35.(b)	(table below) From the table, it can be observed that the maximum class frequency is 20, belonging to class interval 40 – 50 Therefore, modal class = 40 – 50 .... Class size, h = 10 Lower limit of modal class, l = 40 Frequency of modal class, f_1 = 20 Frequency of class preceding modal class, f_0 = 12 Frequency of class succeeding the modal class, f_2 = 11 .... Mode = $l + [(f_1 - f_0)/(2f_1 - f_0 - f_2)] \times h$ .... $= 40 + [(20 - 12)/(2 \times 20 - 12 - 11)] \times 10$	1 1 1 1/2

Number of Cars	Frequency
0-10	7
10-20	14
20-30	13
30-40	12
40-50	20
50-60	11
60-70	15
70-80	8

	$= 40 + [8/(40 - 23)] \times 10$ $= 40 + (8/17) \times 10$ $= 40 + 4.705$ ……… $= 44.705$ ≈ 44.7 Hence, the mode is 44.7	1 1/2
	Section - E	
36.	(i) Time = $\frac{\text{Distance}}{\text{Speed}}$	1
	(ii)Let the usual speed of plane be x km/h New increased speed of plane= (x + 250)km/h Total distance=1500 km According to question $$\frac{1500}{x} - \frac{1500}{x+250} = \frac{1}{2}$$ ……… $\frac{1500(x\ + 250) - 1500x}{x(x + 250)} = \frac{1}{2}$ $\frac{1500\text{x}\ + 375000 - 1500\text{x}}{\text{x}(\text{x} + 250)} = \frac{1}{2}$ $X^2 + 250x = 750000$ $X^2 + 250x - 750000 = 0$	1/2 1/2
	(iii)(a) $X^2 + 250x - 750000 = 0$ $X^2 + 1000x - 750x - 750000 = 0$ $X(x+1000) - 750(x+1000) = 0$ $(x+1000)(x-750) = 0$ ……… $X = -1000$ or $x = 750$ Reject x=-1000, because speed cannot be negative. Hence,usual speed of plane is 750km/h.	1 1
	(iii)(b) $X^2 + 250x - 750000 = 0$	

	X^2 +1000x - 750x- 750000=0 X(x+1000)-750(x +1000)=0 (x+1000)(x-750)=0 ………………………………………………………………………… X=-1000 or x = 750 Reject x=-1000, because speed cannot be negative. Hence,new speed of plane is x+250= 750+250=1000km/h.	1 1
37.	(i) Since,radius at a point of contact is perpendicular to tangent. ∴ By Pythagoras theorem, we have PA = $\sqrt{PS^2 + AS^2}$=$\sqrt{12^2 + 5^2}$ =$\sqrt{169}$ = 13 cm ………………………………………………………………………… (ii)one common tangent can be drawn when two circles touch externally. ………………………………………………………………………… (iii)(a) By Pythagoras theorem, we have BQ = $\sqrt{\mathrm{TQ}^2 + \mathrm{TQ}^2}$=$\sqrt{3^2 + 4^2}$ =$\sqrt{25}$ = 5 cm ………………………………………………………………………… QY= BQ- BY = 5-4 =1 cm ………………………………………………………………………… (iii) (b) PK= PA + AK = 13 + 5 = 18 cm ………………………………………………………………………… XY = XK + KY= 10 +8 = 18 cm	1 1 1 1 1 1
38.	(i) Total no. of fish in the aquarium = 13+18+12+11= 54 Number of male fish in the aquarium = 36 ∴Number of female fish in the aquarium =54- 36 =18 So,probability of selecting a female fish=	1

	$\frac{\text{no.of favourable outcomes}}{\text{total no.of possible outcomes}} = \frac{18}{54} = \frac{1}{3}$	1
	………………………………………………………………………………………………	
	(ii) The probability of selecting a flowerhorn fish= $\frac{\text{no.of favourable outcomes}}{\text{total no.of possible outcomes}} = \frac{18}{54} = \frac{1}{3}$	1
	………………………………………………………………………………………………	1
	(iii) (a) The probability of selecting a koi fish $= \frac{\text{no.of favourable outcomes}}{\text{total no.of possible outcomes}} = \frac{12}{54} = \frac{2}{9}$	
	………………………………………………………………………………………………	
	P(selecting a guppy fish) $= \frac{\text{no.of favourable outcomes}}{\text{total no.of possible outcomes}} = \frac{13}{54}$	1
	(iii) (b)Total no. of angel fish and flowerhorn fish= 18 +11 =29 P (selecting either angel fish or flowerhorn fish)= $\frac{29}{54}$	
	………………………………………………………………………………………………	
	P (selecting neither angel fish nor flowerhorn fish) = =1- P (selecting either angel fish or flowerhorn fish) $= 1- \frac{29}{54} = \frac{25}{54}$	1