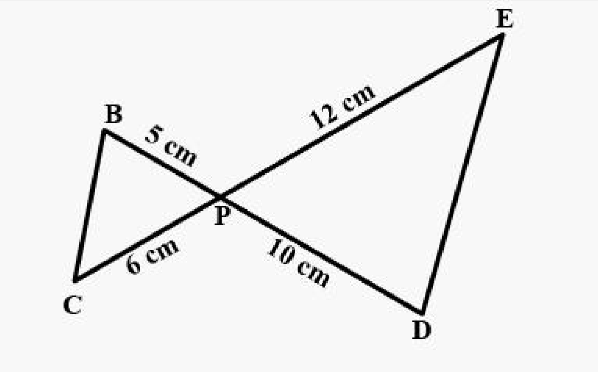
MARKING SCHEME BSEH PRACTICE PAPER 2, 10TH MATHS(BASIC) , March2025
(ENGLISH MEDIUM)

Q. no.	Expected solutions	marks
	Section-A	
1	(d)60	1
2	(d)more than 3	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)	1/2
	…… When the equation (ii) is subtracted from equation (i) we get, $5y = -15$ $y = -3$ …………………………………(iii)	1/2
	…… When the equation (iii) is substituted in (i) we get, $3x - 12 = -6$ $3x = 6$ $x = 2$ Hence, $x = 2$, $y = -3$	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)	1/2
	…… Breadths are equal, i.e., AD = BC Hence, $3x + y = 7$ …(ii)	1/2
	…… On multiplying Eq. (ii) by 3 and then subtracting Eq. (i), We get, $8x = 8$ So, $x = 1$	1/2
	…… 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
22.	Let (– 4, 6)divide AB internally in the ratio k : 1. Using the section formula, we get $(-4, 6) = (\frac{3k-6}{k+1}, \frac{-8k+10}{k+1})$ ……	1

	So, $-4 = \frac{3k-6}{k+1}$ …………………………………………………………………………………………… ⇒ – 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 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. …………………………………………………………………………………………… Then, by SAS similarity criteria ΔPBC ~ ΔPDE	1 1/2 1/2
24.	We know that,	

(b)	cos 60° = 1/2 sec 30° = 2/√3 tan 45° = 1 sin 30° = 1/2 cos 30° = √3/2 ………………………………………… Now, substitute the values in the given problem, we get $(5\cos^2 60^\circ + 4\sec^2 30^\circ - \tan^2 45^\circ)/(\sin^2 30^\circ + \cos^2 30^\circ)$ $= \{5(1/2)^2+4(2/\sqrt{3})^2-1\}/(1/2)^2+(\sqrt{3}/2)^2$ ………………………………………… = (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 = $\sqrt{\frac{1+\text{sinA}}{1-\text{sinA}}} =$ $= \sqrt{\frac{1+sinA}{1-sinA} \times \frac{1+sinA}{1+sinA}}$ ………………………………………… $=\frac{1+\text{sinA}}{\sqrt{1-\sin^2 \text{A}}}$ …………………………………………	1/2 1/2

	$= \frac{1+\sin A}{\sqrt{\cos^2 A}}$ …… $= \frac{1+\sin A}{\cos A}$ = 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	

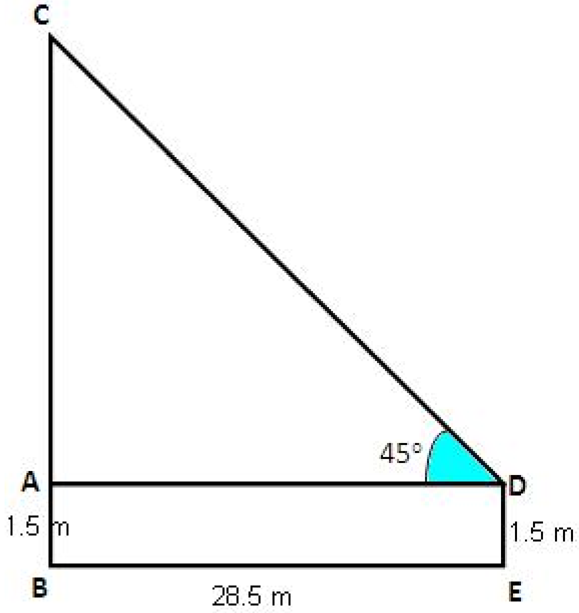
26.	Prove that $\sqrt{2}$ is irrational. Solution: Let, if possible, $\sqrt{2}$ be a rational no.	1/2
	$\therefore \sqrt{2} = \frac{p}{q}$, where p and q are co-prime integers and $q \neq 0$.	1/2
	$\Rightarrow 2 = \frac{p^2}{q^2}$ $\Rightarrow p^2 = 2\ q^2$ ....(i) $\Rightarrow$ 2 divides $p^2 \Rightarrow$ 2 divides p also.	1/2
	Let p = 2m,...............................(ii) where m is any integer. $\Rightarrow p^2 = 4m^2$...............................(iii)	1/2
	From (ii) and (iii) $2q^2 = 4m^2$ $\Rightarrow q^2 = 2m^2$ $\Rightarrow$ 2 divides $q^2 \Rightarrow$ 2 divides q also. $\Rightarrow$ q = 2n....................................(iv)	1/2
	From (i) and (iv) , p and q have 2 as common factor. $\therefore$ p and q are not co-prime. Hence our supposition is wrong. $\therefore \sqrt{2}$ is an irrational number.	1/2
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 = $3/2, -1/3$ ……	1
	$\alpha+\beta=-b/a \Rightarrow (3/2)+(-1/3)=7/6=-(-7)6=-b/a$ ……	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. ……	1/2
	Five years hence(later), $x+5=3(y+5)$ $\Rightarrow x+5=3y+15$ $\Rightarrow x-3y=10$.......(1) ……	1/2
	Also, five years ago(before), $x-5=7(y-5)$ $\Rightarrow x-5=7y-35$ $\Rightarrow x-7y=-30$........(2) ……	1/2
	Subtracting equation (2) from (1), $x-3y-x+7y = 10+30$ ($\because$eq.(2) changes its sign)	1/2

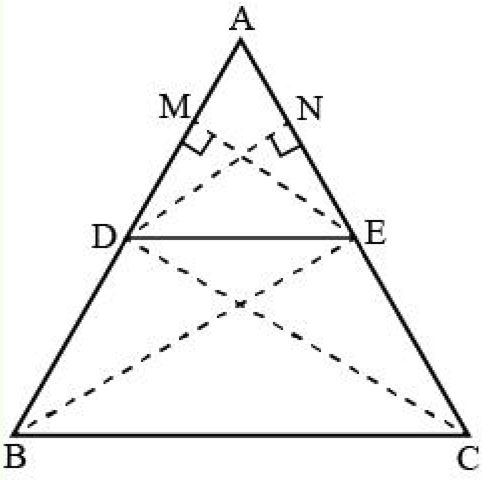
	$4y = 40$ $\Rightarrow y = 10$ …… Put $y = 10$ in eq. (1), $x - 3(10) = 10$ $\Rightarrow x - 30 = 10$ $\Rightarrow x = 40$ …… Thus, present age of Rahul=x=40 years and present age of Rahul's son=y=10 years.	1/2 1/2
28. (b)	Let the larger angle = x Smaller angle = y As both angles are supplementary, $x + y = 180$ $\Rightarrow x = 180 - y$ .... (i) …… Difference is 18 degrees. So, $x - y = 18$ $\Rightarrow x = 18 + y$ .... (i) …… Substituting the value of x in equation (i) we get, $\Rightarrow 18 + y = 180 - y$ $\Rightarrow - y - y = 18 - 180$ $\Rightarrow - 2y = -162$ $\Rightarrow y = -162/-2$ $\Rightarrow y = 81$ …… Substituting the value of y in equation (i), we get, $\Rightarrow x = 180 - 81 = 99$	1 1/2 1/2 1/2

	…………………………………………………………………………… Hence, the angles are 99° and 81°.	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 = ± 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, $\cos A + \cos^2 A = 1$ $\Rightarrow \cos A = 1 - \cos^2 A$ $\Rightarrow \cos A = \sin^2 A$ [∵ $\sin^2 A = 1 - \cos^2 A$] ………………………(i) ……………………………………………………………………………	1
	LHS=$(\sin^2 A + \sin^4 A)$ = $(\sin^2 A + (\sin^2 A)^2)$ ……………………………………………………………………………	1/2

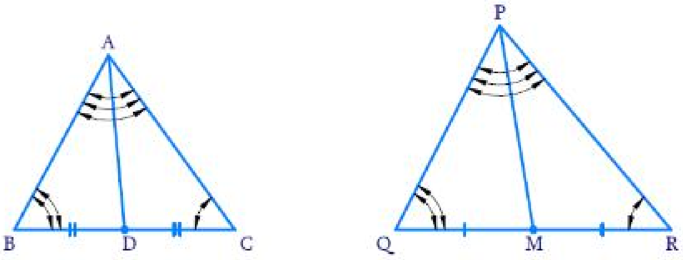
	$= (\sin^2A + (\cos A)^2)$ [using (i)]	1
	……	
	$= \sin^2A + \cos^2A$ $= 1 =$ RHS	1/2
30. (b)	LHS$=(\sin A+\text{cosec}A)^2+(\cos A+\sec A)^2$	
	$=\sin^2A+\text{cosec}^2A+2\sin A\,\text{cosec}A+\cos^2A+\sec^2A+2\cos A\sec A$	1/2
	……	
	$=\sin^2A+\cos^2A+\text{cosec}^2A+\sec^2A+2\sin A\times1/\sin A+2\cos A\times1/\cos A$ [$\because\text{cosec}A=1/\sin A$ and $\sec A=1/\cos A$]	1
	……	
	$=1+\text{cosec}^2A+\sec^2A+2+2$ [$\because\sin^2A+\cos^2A=1$]	1/2
	……	
	$=5+(1+\cot^2A)+(1+\tan^2A)$ [$\because1+\tan^2A=\sec^2A$ and $1+\cot^2A=\text{cosec}^2A$] $=7+\tan^2A+\cot^2A=$ RHS	1
	……	

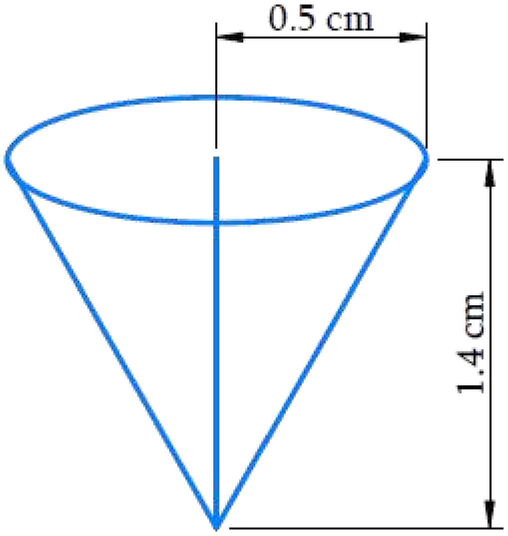
31.		1/2
	…… Given the height of the observer be DE = 1.5 m That is AB = 1.5 m Let BC = h is the height of the chimney Hence AC = (h – 1.5) m Given the distance between the observer and the chimney is AD = BE = 28.5 m	1/2
	…… In right $\triangle CAD, \theta = 45^{o}$ $\tan 45^{o} = AC/AD$ $\Rightarrow 1 = (h - 1.5)/28.5$	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, $a_3 = 18$	1

	Common difference, $d = a_3 - a_2 = 18 - 14 = 4$	
	We know that nth term of an AP is, $a_n = a + (n - 1)d$ $a_2 = a + d$ $14 = a + 4$ $a = 10$	1
	Sum of n terms of AP is given by $S_n = n/2\ [2a + (n - 1)\ d]$	1
	$S_{51} = 51/2\ [2 \times 10 + (51 - 1)\ 4]$	1
	$= 51/2\ [20 + 50 \times 4]$ $= 51/2 \times 220$ $= 51 \times 110$ $= 5610$	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.	1/2
	According to the question, $a_3 = 16$ and $a_7 - a_5 = 12$ $a + (3 - 1)d = 16$ $a + 2d = 16$ .... (1)	1
	Using $a_7 - a_5 = 12$ $[a + (7 - 1)\ d] - [a + (5 - 1)\ d] = 12$ $[a + 6d] - [a + 4d] = 12$ $2d = 12$ $d = 6$	$1\frac{1}{2}$
	By substituting this in equation (1), we obtain $a + 2 \times 6 = 16$	

	a + 12 = 16 a = 4	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)	**Statement:Basic Proportionality Theorem** Prove that if a line is drawn parallel to one side of a triangle ,the other two sides are divided in the same ratio.	1
	…………………………………………………………………………	
	Given: In ΔABC, $DE \parallel BC$	1/2
	. . . .  	1/2
	. . . .	
	To prove: $\frac{\mathbf{AD}}{\mathbf{DB}} = \frac{\mathbf{AE}}{\mathbf{EC}}$	1/2

	——— **Construction :** Draw EM⊥AB and DN⊥AC. Join B to E and C to D --- **Proof**: In ΔADE and ΔBDE $\frac{\textbf{Area of}\Delta\textbf{ADE}}{\textbf{Area of }\Delta\textbf{BDE}} = \frac{\frac{1}{2}\times\textbf{AD}\times\textbf{EM}}{\frac{1}{2}\times\textbf{DB}\times\textbf{EM}} = \frac{\textbf{AD}}{\textbf{DB}}$--------------(i) --- In ΔADE and ΔCDE $\frac{\textbf{Area of}\Delta\textbf{ADE}}{\textbf{Area of }\Delta\textbf{CDE}} = \frac{\frac{1}{2}\times\textbf{AE}\times\textbf{DN}}{\frac{1}{2}\times\textbf{EC}\times\textbf{DN}} = \frac{\textbf{AE}}{\textbf{EC}}$ --------------(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]	1/2 1/2 1/2 1/2

	-- From eq. (i), (ii) and (iii) $: \frac{\mathbf{AD}}{\mathbf{DB}} = \frac{\mathbf{AE}}{\mathbf{EC}}$ Hence proved.	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
	$= l \times b \times h - 4 \times 1/3\ \pi r^2 h_1$ ……………………………………………………………………	1
	= (15 cm × 10 cm × 3.5 cm) - (4 × 1/3 × 22/7 × 0.5 cm × 0.5 cm × 1.4 cm) ……………………………………………………………………	1
	$= 525\ cm^3 - 1.47\ cm^3$ $= 523.53\ cm^3$ The volume of wood in the entire stand is $523.53\ cm^3$.	1
34. (b)	The total surface area of the cube	

<table>
<tr>
<td></td>
<td>$=6\times(\text{edge})^2=6\times5\times5\text{ cm}^2=150\text{ cm}^2$.
……
The surface area of the block = Total Surface Area of cube - base area of hemisphere + Curved Surface Area of hemisphere
……
$=150-\pi r^2+2\pi r^2$
$=(150+\pi r^2)\text{ cm}^2$,
……
$=150\text{ cm}^2+(22/7\times4.2/2\times4.2/2)\text{ cm}^2$
$=(150+13.86)\text{ cm}^2$
……
$=163.86\text{ cm}^2$</td>
<td>1
1
1
1
1</td>
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<tr>
<td>35. (a)</td>
<td>
<table>
<tr><td>class interval</td><td>class-mark (x_i)</td><td>Number of children(f_i)</td><td>f_ix_i</td></tr>
<tr><td>11-13</td><td>12</td><td>7</td><td>84</td></tr>
<tr><td>13-15</td><td>14</td><td>6</td><td>84</td></tr>
<tr><td>15-17</td><td>16</td><td>9</td><td>144</td></tr>
<tr><td>17-19</td><td>18</td><td>13</td><td>234</td></tr>
<tr><td>19-21</td><td>20</td><td>f</td><td>20f</td></tr>
<tr><td>21-23</td><td>22</td><td>5</td><td>110</td></tr>
<tr><td>23-25</td><td>24</td><td>4</td><td>96</td></tr>
<tr><td></td><td></td><td>$\sum f_i=44+f$</td><td>$\sum f_ix_i=752+20f$</td></tr>
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$\text{Mean} = \overline{x} = \frac{\sum f_i x_i}{\sum f_i}$ 1/2

……

$\Rightarrow 18 = \frac{752+20f}{44+f}$ 1/2

……

$\Rightarrow 18(44+f) = 752+20f$ 1/2

$\Rightarrow 792 + 18f = 752 + 20f$

……

$\Rightarrow 792-752 = 20f - 18f$ 1/2

……

$\Rightarrow 40 = 2f$

$\Rightarrow f = 20$ 1

Hence, missing frequency f =20

35. (b)

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

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 1

……

Class size, h = 10
Lower limit of modal class, l = 40
Frequency of modal class, $f_1 = 20$ 1
Frequency of class preceding modal class, $f_0 = 12$

	Frequency of class succeeding the modal class, $f_2 = 11$ …………………………………………………………………………………………	
	Mode = $l + [(f_1 - f_0)/(2f_1 - f_0 - f_2)] \times h$ …………………………………………………………………………………………	1
	= 40 + [(20 - 12)/(2 × 20 - 12 - 11)] × 10 …………………………………………………………………………………………	1/2
	= 40 + [8/(40 - 23)] × 10 = 40 + (8/17) × 10 = 40 + 4.705 …………………………………………………………………………………………	1
	= 44.705 ≈ 44.7 Hence, the mode is 44.7	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 $\frac{1500}{x} - \frac{1500}{x+250} = \frac{1}{2}$ …………………………………………………………………………………………	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 +250 x = 750000 X^2 +250 x - 750000=0	1/2

	(iii)(a) X^2 +250 x - 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 +250 x - 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 ……………………………………………………………………………………………	1 1 1 1

	(iii) (b) PK= PA + AK = 13 + 5 = 18 cm …………………………………………………………………………………………………… XY = XK + KY= 10 +8 = 18 cm	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= $\frac{\text{no. of favourable outcomes}}{\text{total no. of possible outcomes}} = \frac{18}{54} = \frac{1}{3}$ …………………………………………………………………………………………………… (ii)The probability of selecting a flowerhorn fish= $\frac{\text{no. of favourable outcomes}}{\text{total no. of possible outcomes}} = \frac{18}{54} = \frac{1}{3}$ …………………………………………………………………………………………………… (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 1 1 1

	(iii) (b)Total no. of angel fish and flowerhorn fish= 18 +11 =29	
	P (selecting either angel fish or flowerhorn fish)= $\frac{29}{54}$	1
	………	
	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