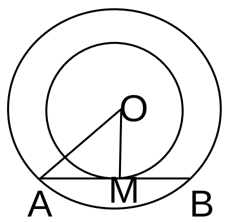
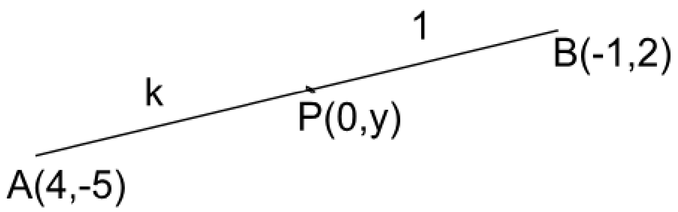
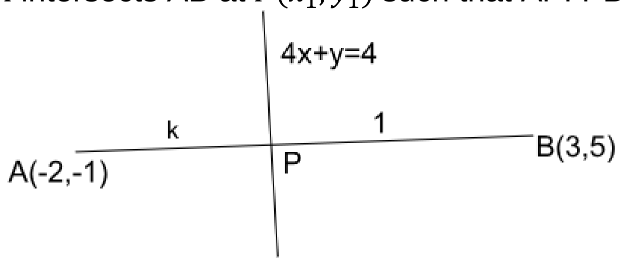
Marking Scheme
Class X Session 2024-25
MATHEMATICS BASIC (Code No.241)
(For Visually Impaired)

TIME: 3 hours **MAX.MARKS: 80**

Q. No.	Section A	Marks
1.	B) 90	**1**
2.	C) either intersecting or coincident	**1**
3.	D) 7	**1**
4.	C) $2\sqrt{a^2+b^2}$	**1**
5.	D) $145°$	**1**
6.	D) 15 cm	**1**
7.	A) $\frac{5}{4}$	**1**
8.	B) Similar but not congruent	**1**
9.	C) 3780	**1**
10.	B) 40	**1**
11.	D) $\frac{2}{3}$	**1**
12.	D) $\sqrt{119}$ cm	**1**
13.	A) cos $60°$	**1**
14.	(C) $3\pi r^2$	**1**
15.	D) 4	**1**
16.	B) real and equal	**1**
17.	C) 30 - 40	**1**
18.	D) $25x^2-5x-2$	**1**
19.	A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)	**1**
20.	C) Assertion (A) is true but reason (R) is false.	**1**

	Section B	
21(A).	$PA^2 = PB^2$ $\Longrightarrow (x-4)^2 + (y-3)^2 = (x-3)^2 + (y-4)^2$ $\Longrightarrow x = y \quad or \quad x - y = 0$	**1** **1**
	OR	
21 (B).	**L**et the points be $A\,(-4,-1),\ B\,(-2,-4),\ C\,(4,0)$ and $D(2,3)$ Mid-point of AC = $\left(\frac{-4+4}{2}, \frac{-1+0}{2}\right) = \left(0, -\frac{1}{2}\right)$ Mid-point of BD = $\left(\frac{-2+2}{2}, \frac{-4+3}{2}\right) = \left(0, -\frac{1}{2}\right)$ Since mid-points of AC and BD are same ∴ ABCD is a parallelogram (as diagonals of parallelogram bisect each other)	**1** **½** **½**
22.	 AM = 4 cm OM = $\sqrt{OA^2 - AM^2}$ = $\sqrt{5^2 - 4^2}$ = 3 cm	**½** **½** **1**
23 (A).	$\frac{12}{2}[2 \times 20 + 11d]$=900 $\Rightarrow\ d = 10$ Also $a_{12} = 20 + 11 \times 10 = 130$	**½** **1** **½**
	OR	
23 (B).	Putting $n = 1,\ S_1 = a = 6 - 1^2 = 5 \ldots\ldots\ldots\ldots (i)$ Putting $n = 2,\ S_2 = 2a + d = 6 \times 2 - 2^2 = 8 \ldots\ldots\ldots\ldots (ii)$ Solving (i) & (ii) $\quad d = -2$	**½** **1** **½**
24.	$sin(A-B) = \frac{1}{2} \Rightarrow A - B = 30°$ ……….(i) $cos(A+B) = \frac{1}{2} \Rightarrow A + B = 60°$ ……….(ii) Solving (i) & (ii) to get $A = 45°, B = 15°$	**½** **½** **½+½**
25.	(see table below)	

Class	5-10	10-15	15-20	20-25	25-30	30-35
Frequency	5	6	15	10	5	4

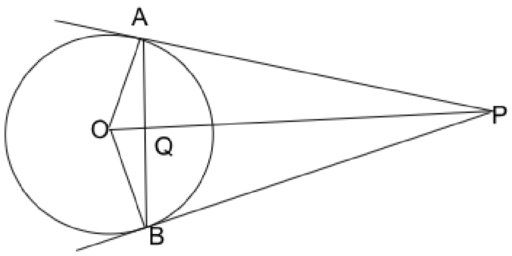
	Modal class is 15-20. $Mode = 15 + 5 \times (\frac{15-6}{2\times15-6-10})$ $= 18.21$(approx.)	½ 1 ½
	Section-C	
26	Let $\sqrt{5}$ be a rational number. $\therefore \sqrt{5} = \frac{p}{q}$, where q≠0 and p & q are coprime. $5q^2 = p^2 \Longrightarrow p^2$ is divisible by 5 $\Longrightarrow$ p is divisible by 5----- (i) $\Longrightarrow$ p = 3a, where ‘a’ is a postive integer $25a^2 = 5q^2 \Longrightarrow q^2 = 5a^2 \Longrightarrow q^2$ is divisible by 5 $\Longrightarrow$ q is divisible by 5 ----- (ii) (i) and (ii) leads to contradiction as ‘p’ and ‘q’ are coprime. $\therefore \sqrt{5}$ is an irrational number.	½ 1 1 ½
27(A).	Let the required point on the y axis be P(0,y).  Let AP : PB be k : 1 Therefore, $\frac{-k+4}{k+1} = 0$ ⇒k=4 Therefore, required ratio is 4:1 & $y = \frac{8-5}{5} = \frac{3}{5}$ Hence point of intersection is (0,$\frac{3}{5}$).	½ 1 ½ ½ ½
	OR	
27 (B).	Let the line $4x + y = 4$ intersects AB at $P(x_1, y_1)$ such that AP: PB=k:1 	

	$x_1=\frac{3k-2}{k+1}$ and $y_1=\frac{5k-1}{k+1}$	**1**
	(x_1, y_1) lies on $4x+y=4$	
	Therefore, $4(\frac{3k-2}{k+1})+(\frac{5k-1}{k+1})=4$	**½**
	$\Rightarrow k=1$	**1**
	Required ratio is 1:1	**½**
28.	LHS= $(\frac{1}{sinA}-sinA)(\frac{1}{cosA}-cosA)$	**½**
	$=\frac{1-sin^2A}{sinA}\times\frac{1-cos^2A}{cosA}$	**1**
	$=\frac{cos^2A}{sinA}\times\frac{sin^2A}{cosA}$	
	$=cosA\ sinA$	**½**
	RHS = $\frac{cosA\ sinA}{sin^2A+cos^2A}$	
	$=cosA\ sinA$ = LHS	**1**
29.		

Class	x	frequency(f)	$u=\frac{x-25}{10}$	fu
0-10	5	6	-2	-12
10-20	15	10	-1	-10
20-30	25	15	0	0
30-40	35	9	1	9
40-50	45	10	2	20
		$\sum f$ =50		$\sum fu=7$

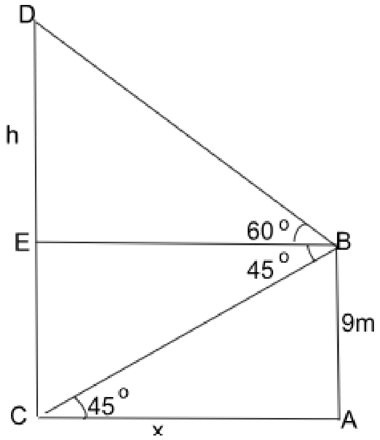
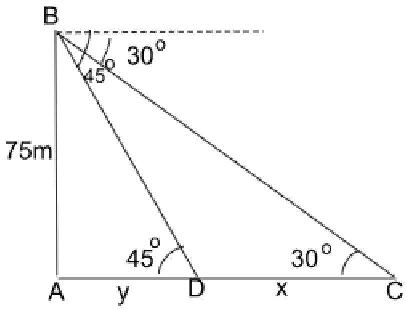
Correct table $1\frac{1}{2}$

	$Mean=25+10\times(\frac{7}{50})$	**1**
	= 26.4	**½**
30 (A).		



	(i) $\Delta OAP\cong\Delta OBP$	
	$\angle APO=\angle BPO$	
	Or OP bisects $\angle P$	**1**
	(ii)$\Delta AQP\cong\Delta BQP$	
	$\Rightarrow$AQ=QB and $\angle AQP=\angle BQP$	**1**

	AB is a straight line therefore $\angle AQP = \angle BQP = 90°$ Hence OP is right bisector of AB	**1**
	OR	
30 (B).	Correct Given, to prove and construction Correct proof	**1** **2**
31.	Let the two-digit number be $10x + y$ Therefore $(10x + y) + (10y + x) = 99$ $\Rightarrow x + y = 9$ ……….(i) Also, $x = 3 + y$……..(ii) Solving (i) & (ii) to get $y = 3, x = 6$ Therefore, required number is 63	**½** **½** **½** **½** **½** **½**
	Section D	
32 (A).	Let the number of books purchased be x Therefore, cost price of 1 book = $\frac{1920}{x}$ Therefore $\frac{1920}{x} - \frac{1920}{x+4} = 24$ $\Rightarrow 1920 \times 4 = 24x(x + 4)$ or $x^2 + 4x - 320 = 0$ $\Rightarrow (x + 20)(x - 16) = 0$ $\Rightarrow x = 16, x \neq -20$ Number of books bought=16 Price of each book =$\frac{1920}{16} = ₹120$	**1** **1** **1** **1** **1**
	OR	
32 (B).	Let the initial average speed of the train be x km/hr. Therefore $\frac{132}{x} + \frac{140}{x+4} = 4$ $\Rightarrow 4x^2 - 256x - 528 = 0$ or $x^2 - 64x - 132 = 0$ $\Rightarrow (x - 66)(x + 2) = 0$ $\Rightarrow x = 66, \ x \neq -2$ Initial average speed of train= 66 km/hr Time taken to cover the distances separately = $\frac{132}{66}$ & $\frac{140}{70}$ i.e. 2 hours each	**1** **1** **1** **1** **1**
33.	Correct Given, to prove and construction Correct Proof	$\frac{1}{2} \times$ **3=1½** **3½**

34.	Perimeter of sector = $2r + l = 25.8$ $\Rightarrow l = 25.8 - 12.6$ $\Rightarrow\ l = 13.2$ cm Area of sector = $\frac{1}{2}lr$ $= \frac{1}{2} \times 13.2 \times 6.3$ $= 41.58\ cm^2$	**1½** **1** **1** **1½**
35 (A).	 Let AB be the building and CD be the tower. Here $tan60° = \sqrt{3} = \frac{h}{x}$ $\Rightarrow h = x\sqrt{3}$………..(i) $tan45° = \frac{9}{x} = 1$ $\Rightarrow\ x = 9$ m…………(ii) (Distance between tower and building) Solving (i) & (ii) to get $h = 9 \times 1.732 = 15.588\ m$ Therefore, the height of the tower $= h + 9 = 24.588\ m$.	**1 mark for correct figure** **1** **½** **1** **½** **½** **½**
	OR	
35 (B).	 Let AB be the light house and C & D be positions of ships. $tan30°=\frac{1}{\sqrt{3}} = \frac{75}{x+y}$ $\Rightarrow x + y = 75\sqrt{3}$…………..(i) $tan45°=1=\frac{75}{y}$ $\Rightarrow y\ =\ 75$………(ii) Solving (i) & (ii) to get $x = 75(\sqrt{3} - 1)$ $\Rightarrow x = 75 \times 0.732$	**1 mark for correct figure** **1** **½** **1** **½** **1**

	$= 54.9\ m$ Distance between the ships is $54.9\ m$	
	Section E	
36.	(i) Number of students who do not prefer to walk = 200-120 = 80 P (selected student doesn't prefer to walk) = $\frac{80}{200}$ or $\frac{2}{5}$ (ii) Total number of students who prefer to walk or use bicycle = 120 + 50 = 170 P (selected student prefers to walk or use bicycle) = $\frac{170}{200}$ or $\frac{17}{20}$ (iii) (A) 50% of walking students who used bicycle = 60 Number of students who already use bicycle = 50 P (selected student uses bicycle) = $\frac{110}{200}$ or $\frac{11}{20}$ **OR** (B) Number of students who preferred to be dropped by car = $200 - (120 + 50 + 20)$ = 10 students P (selected student is dropped by car) = $\frac{10}{200}$ or $\frac{1}{20}$	**½** **½** **½** **½** **½** **½** **1** **1** **1**
37.	(i) $a > 0$ and $a \in R$ (ii) $x^2 - Sx + P$ (where $S = -1, P = -2$) $= x^2 + x - 2$ (iii) (A) $(k-2)(-1)^2 - 2(-1) - 5 = 0$ Solving, we get $k = 5$ **OR** (B) $\alpha + \beta = 7, \alpha\beta = 12$ Now, $\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\beta+\alpha}{\alpha\beta} = \frac{7}{12}$	**1** **1** **1** **1** **½ + ½** **1**
38.	Given, height of cylinder $= h = 12$ cm radius of cylinder = 3 cm slant height of cone = 5 cm (i) Let x be the height of cone $x^2 + 3^2 = 5^2$ $\Rightarrow x = 4$ cm (ii) Curved surface area of cylinder $= 2\pi rh$ $= 2 \times 3.14 \times 3 \times 12$ $= 226.08\ cm^2$ (iii) (A) Curved surface area of the cone	 **½** **½** **½** **½**

	$= \pi\, r\, l$ $= 3.14 \times 3 \times 5$ $= 47.1\ cm^2$ Area of the base circle = $3.14 \times 3^2 = 28.26\ cm^2$ So, total surface area of the toy = CSA of cylinder + CSA of cone + area of base circle $= (226.08 + 47.1 + 28.26)\ cm^2$ $= 301.44\ cm^2$ **OR** (B) Combined volume of the toy = volume of cone + volume of cylinder $= \frac{1}{3}\pi\, r^2 x + \pi\, r^2 h$ $= \pi \times r^2 \left(\frac{1}{3} \times 4 + 12\right)\ cm^3$ $= 3.14 \times 9 \times \frac{40}{3}\ cm^3$ $= 376.8\ cm^3$	½ ½ ½ ½ ½ ½ ½ ½