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

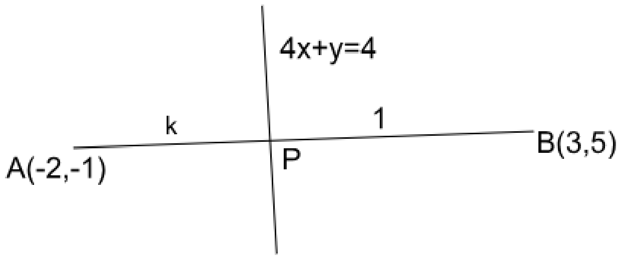
TIME: 3 hours **MAX.MARKS: 80**

Q. No.	Section A	Marks
1.	B) 45	**1**
2.	A) consistent with unique solution	**1**
3.	B) 4,5	**1**
4.	C) $2\sqrt{a^2+b^2}$	**1**
5.	A) 70°	**1**
6.	D) 3cm	**1**
7.	B) $-2/\sqrt{2}$	**1**
8.	B) ΔEAD	**1**
9.	B) xy^2	**1**
10.	B) 49	**1**
11.	D) 52°	**1**
12.	C) 15 cm	**1**
13.	C) 30°	**1**
14.	(B) 6	**1**
15.	A) 3/13	**1**
16.	C) Not real	**1**
17.	C) 30 - 40	**1**
18.	D) $25x^2 - 5x - 2$	**1**
19.	B) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)	**1**
20.	A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)	**1**
	Section B	

<table>
<tr><td>21 (A).</td><td>$PA^2 = PB^2$
$\Rightarrow (a-5)^2 + (b-4)^2 = (a-4)^2 + (b-5)^2$
$\Rightarrow a = b \quad or\ a - b = 0$</td><td>1
1</td></tr>
<tr><td></td><td>OR</td><td></td></tr>
<tr><td>21 (B).</td><td>Coordinate of origin(mid point of PQ)=(0.0)
Let coordinate of P =(x,y)
x=4, y=0</td><td>½
1/2
1</td></tr>
<tr><td>22</td><td>$\angle ATB = 2X40^0 = 80^0$
$\angle AOB = 180^0 - 80^0 = 100^0$</td><td>1
1</td></tr>
<tr><td>23 (A).</td><td>(3y+5)-(3y-1)= 6
$\Rightarrow d = 6$
Also 6=(5y+1) –(3y+5)
$\Rightarrow$ y=5</td><td>1
1</td></tr>
<tr><td></td><td>OR</td><td></td></tr>
<tr><td>23 (B).</td><td>Putting $n = 1,\ S_1 = a = 6 - 1^2 = 5$ (i)
Putting $n = 2,\ S_2 = 2a + d = 6 \times 2 - 2^2 = 8$ (ii)
Solving (i) & (ii) $d = -2$</td><td>½
1
½</td></tr>
<tr><td>24.</td><td>$sin(A + B) = \sqrt{3}/2 \Rightarrow A + B = 60^\circ$ (i)
$\sin(A - B) = 1/2 \Rightarrow A - B = 30^\circ$ (ii)
Solving (i) & (ii) to get $A = 45^\circ, B = 15^\circ$</td><td>½
½
½+½</td></tr>
<tr><td>25.</td><td><table><tr><td>Class</td><td>0-20</td><td>20-40</td><td>40-60</td><td>60-80</td><td>80-100</td></tr><tr><td>Frequency</td><td>5</td><td>10</td><td>12</td><td>6</td><td>3</td></tr></table>Here, l = 40, f_0 = 10, f_1 = 12, f_2 = 6, h = 20
Mode=l+(f1−f0)/(2f1−f0−f2)×h
Mode = 45</td><td>½
½
1</td></tr>
<tr><td></td><td>Section-C</td><td></td></tr>
</table>

26	Let $\sqrt{3}$ be a rational number. $\therefore \sqrt{3} = \frac{p}{q}$, where q≠0 and p & q are coprime. $3q^2 = p^2 \Longrightarrow p^2$ is divisible by 3 $\Longrightarrow$ p is divisible by 3 (i) $\Longrightarrow$ p = 3a, where 'a' is a postive integer	**1/2** **1**

<table>
<tr><td>26.</td><td>$9a^2 = 3q^2 \Rightarrow q^2 = 3a^2 \Rightarrow q^2$ is divisible by 3
$\Rightarrow$ q is divisible by 3 (ii)
(i) and (ii) leads to contradiction as ‘p’ and ‘q’ are co prime.
$\therefore \sqrt{3}$ is an irrational number.</td><td>1

1/2</td></tr>
<tr><td>27(A)</td><td>By using section formula
X= (2X10+3X2)/(2+3) =26/5 =5.2
Y= (2x7+3x3)/(2+3) =23/5 =4.6</td><td>1.5
1.5</td></tr>
<tr><td>27 (B).</td><td>Let the line $2x + y = 4$ intersects AB at $P(x_1, y_1)$ such that AP: PB=k:1


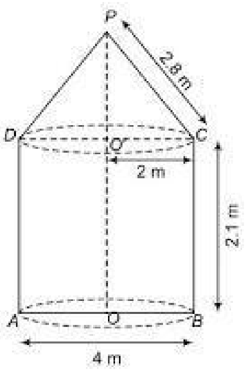
$x_1 = \frac{3k-2}{k+1}$ and $y_1 = \frac{5k-1}{k+1}$
(x_1, y_1) lies on $4x + y = 4$

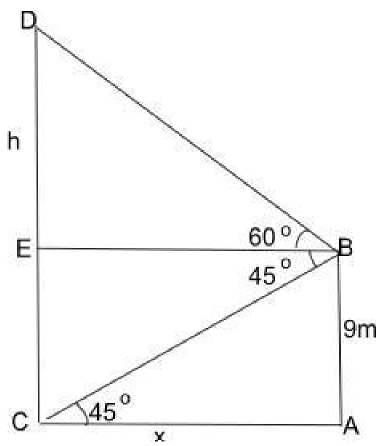
Therefore, $4\left(\frac{3k-2}{k+1}\right)+\left(\frac{5k-1}{k+1}\right)=4$
$\Rightarrow k=1$
Required ratio is 1:1</td><td>1

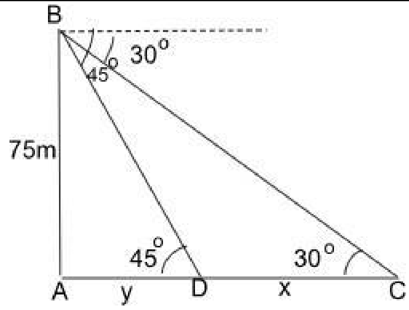
½
1
½</td></tr>
<tr><td>28</td><td>cos A/(1+sin A)+(1+sin A)/cos A
=cos²A+(1+sin A)²/(cos A (1+sin A))
= (cos² A + 1+ sin² A + 2 sin A)/(cos A(1+sin A))
= 2(1+ sin A)/cos A (1+sin A)
= 2/ cos A = 2 sec A (Proved)</td><td>
1
1
1</td></tr>
<tr><td>29.</td><td>

Class	x_i	Frequency f_i	$f_i x_i$
0 – 20	10	17	170
20 – 40	30	p	$30p$
40 – 60	50	32	1600
60 – 80	70	24	1680
80 – 100	90	19	1710
Total		$\Sigma f_i = 92 + p$	$\Sigma f_i x_i = 5160 + 30p$

Mean $= \frac{\Sigma f_i x_i}{\Sigma f_i} \Rightarrow 50 = \frac{5160 + 30p}{92 + p}$
$\Rightarrow 50 \times 92 + 50p = 5160 + 30p$
$\Rightarrow 50p - 30p = 5160 - 4600$
$\Rightarrow 20p = 560 \Rightarrow p = \frac{560}{20} = 28$</td><td>Correct table
1 1 2
1
½</td></tr>
</table>

30 (A).	AB + CD = AD + BC 6 + 8 = AD + 9 14 = AD + 9 14 – 9 = AD AD = 5 cm	**1** **1** **1**
	OR	
30(B)	Figure, Given, To prove proof	**1.5** **1.5**
31	Find the value of x and y by solving these equations ⇒ x = -2 ⇒ y = 5 ⇒ m = -1	**1** **1** **1**
	Section D	
32	 Radius of the cone (r) = Radius of cylinder = 4/2 = 2 m Height of the cylinder (h) = 2.1 m So, the required surface area of the tent = surface area of the cone + surface area of the cylinder $= \pi rl + 2\pi rh$ $= \pi r(l+2h)$ $= (22/7)\times 2(2.8+2\times 2.1)$ $= (44/7)(2.8+4.2)$ $= (44/7)\times 7 = 44\ m^2$ The cost of the canvas of the tent at the rate of ₹500 per m^2 will be = Surface area × cost per m^2 44×500 = ₹22000	**1** **1** **2** **1**

	OR	
32 (B)	Volume of vessel = 200 π/3 cm^3 100X volume of one spherical ball = ¼ volume of vessel $R^3 = 1/8$ R = ½ = 0.5	**1** **2** **1** **1**
33	Correct Given, to prove, Construction and figure Correct Proof	**½ × 4=2** **3**
34	(i) Perimeter of sector = $2r + \frac{2\pi r\theta}{360} = 73.12$ $\Rightarrow 2(24) + \frac{2\times3.14\times24\times\theta}{360} = 73.12$ $\Rightarrow \theta = 60^\circ$ (ii)Area of minor segment = $(\frac{3.14\times24\times24\times60}{360} - \frac{1.73}{4}\times 24\times 24)\ cm^2$ $= (301.44 - 249.12)\ cm^2$ $= 52.32\ cm^2$	**1** **1** **2** **1**
35 (A).	 Let AB be the building and CD be the tower. Here $tan60^\circ = \sqrt{3} = \frac{h}{x}$ $\Rightarrow h = x\sqrt{3}$ (i) $tan45^\circ = \frac{9}{x} = 1$ $\Rightarrow x = 9$ m (ii) (Distance between tower and building) Solving (i) & (ii) to get $h = 9 \times 1.732 = 15.588m$ 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).		**1 mark for correct**

	 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 $x = 75(\sqrt{3} - 1)$ $\Rightarrow x = 75 \times 0.732$ $= 54.9\ m$ Distance between the ships is $54.9\ m$	**figure** **1** **½** **1** **½** **1**

	SECTION - E	
36	i) Total number of outcomes = 50 Total number of odd number cards = 25 Hence probability of getting an odd number card = 25/50 = 1/2 Ii) Total number of perfect square cards = 4 (16, 25, 36 and 49.) Hence probability of getting a heart card = 4/50 = 2/25 iii) a) Total number of cards divisible by 5 = 10 Hence probability of cards divisible by 5 = 10/50 = 1/5 Iii) b) Total number of prime number less than 20 = 4 Hence probability of getting prime number less than 20 = 4/50 = 2/25	**1** **1** **1** **1**
37	i) Has 2 zeroes ii) Has no zeroes iii) let $\alpha = 2$ and $\beta = -3$ $\alpha + \beta = 2 + (-3) = -1$ and $\alpha\beta = 2 \times (-3) = -6$ -(a+1) = -1 b = -6 $a + 1 = b$ $a + 1 = -6$ $a = -7$ and b= -6	**1** **1** **1** **1**
38	i) 15 ii) 27 and 3 iii) n = 10	**1** **1** **2**