Class - X

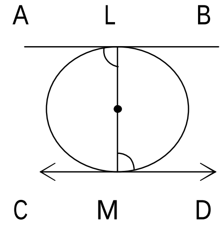
Mathematics-Basic (241)

Marking Scheme-SQP 2019-20

Max. Marks: 80 **Duration: 3 hrs.**

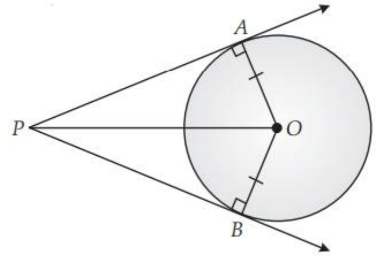
1.	(b) 42	(1)
2.	(a)2 Mean = 3 Median - Mode	(1)
3.	(d)70°	(1)
4.	(b) $5^2 \times 13$	(1)
5.	(a)$\frac{1}{26}$	(1)
6.	(d) 4	(1)
7.	(c) 5.010010001…	(1)
8.	(c) 3	(1)
9.	(b) 5 units	(1)
10.	(b) (- 3, 5)	(1)
11.	(2, 3)	(1)
12.	2 **OR** 1	(1)
13.	1	(1)
14.	0	(1)
15.	4:9	(1)
16.	Sin P = 1/ $\sqrt{2}$	(1)

	OR cosec A = 17/15	
17.	Area of quadrant = $\frac{1}{4} \times \frac{22}{7} \times r^2 = 38.5$ (use $\pi = \frac{22}{7}$) $\Rightarrow r = 7cm$ $\therefore$ diameter = 14 cm	$(\frac{1}{2})$ $(\frac{1}{2})$
18.	$\frac{1}{2}$	1
19.	$\frac{AD}{BD} = \frac{AE}{EC}$ (By B.P.T.) $\frac{1.5}{3} = \frac{1}{EC}$ $\therefore EC = 2\,cm$	$(\frac{1}{2})$ $(\frac{1}{2})$
20.	$A_5 = a_1 + 4d = 0$ $1^2 + 4d = 0$ d = - 3	$(\frac{1}{2})$ $(\frac{1}{2})$
	SECTION - B	
21.	P (Two Head) = $\frac{1}{4}$	(1) (1)
22.	Good bulbs = 25 - 5 = 20 P (good bulb) = $\frac{20}{25} = \frac{4}{5}$ **OR** Of all those outcomes, the ones for which a + b = 8 are: 2+6, 3+5, 4+4, 5+3, 6+2 or 5 outcomes. P = 5/36	(1) (1) (1) (1)

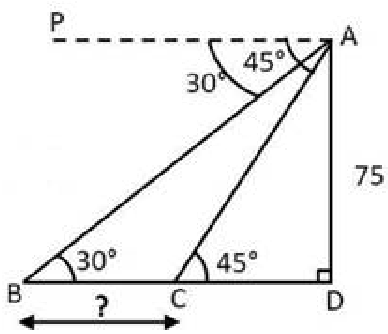
23.	 $\angle OLA = 90°$ $\angle OMD = 90°$ $\angle OLA = \angle OMD$ Which are alternate angles, hence AB ∥ CD	(1) (1)
24.	LHS = tan 48° tan 23°tan 42°tan 67° =Cot (90°-48°) cot (90°-23°) tan 42° tan 67° =Cot 42° cot 67° tan 42° tan 67° =1 OR =Cos 48°cos 42° - Sin 48° Sin 42° =Sin (90° - 48°) sin (90°-42°) - Sin 48° Sin 42° =Sin 42° Sin 48° - Sin 48° Sin 42° = 0	(1) (1) (1) (1)
25.	$r = \frac{7}{2}$ Area of Circle=$\frac{\pi r^2}{4} = \frac{77}{2}$cm^2	(1) (1)
26.	(i) 3 Students (ii) $\frac{x^2+2x+1}{x+1}$ $= \frac{(x+1)^2}{x+1} = x + 1$	(1) (1)
	SECTION - C	

27.	$x^2-3x-10 = 0$ $x^2-5x+2x-10 = 0$ $x(x-5) + 2(x-5)=0$ $(x-5)\ (x+2)=0$ $X = 5, -2$ Sum of the roots = $\frac{-b}{a} = \frac{3}{1}$ which is same as 5 - 2 = 3 product of the roots = $\frac{c}{a}$= -10 which is same as 5x(-2) = -10 Hence verified	(3)
28.	Correct construction of given circle Correct construction of two tangents OR Line of given length Correct position of point which divides the line segment in the given ratio	(1) (2) (1) (2)
29.	Area of track = $120 \times 70 + \pi (35)^2 - [120 \times 56 + \pi (28)^2]$ $= 120 \times 14 + \frac{22}{7} [(35)^2 - (28)^2]$ $= 1680 + \frac{22}{7} \times 7 \times 63$ $= 1680 + 1386$ $= 3066 m^2$ Yes, Meena is wrong.	(1) $\left(1\frac{1}{2}\right)$ $\left(\frac{1}{2}\right)$
30.	L.H.S. $= \frac{\cot A - \cos A}{\cot A + \cos A} = \frac{\frac{\cos A}{\sin A} - \cos A}{\frac{\cos A}{\sin A} + \cos A}$ $= \frac{\cos A\left(\frac{1}{\sin A} - 1\right)}{\cos A\left(\frac{1}{\sin A} + 1\right)} = \frac{\left(\frac{1}{\sin A} - 1\right)}{\left(\frac{1}{\sin A} + 1\right)}$ $= \frac{\operatorname{cosec} A - 1}{\operatorname{cosec} A + 1}$ = R.H.S	(1) (1)

	OR L.H.S. $= \dfrac{\tan A + \sin A}{\tan A - \sin A}$ $= \dfrac{\frac{Sin\ A}{Cos\ A} + \text{Sin}\ A}{\frac{Sin\ A}{Cos\ A} - \cos A} = \dfrac{Sin\ A}{Sin\ A}\ \dfrac{[Sec\ A+1]}{[Sec\ A-1]}$ = R.H.S	(1) $(\frac{1}{2})$ $(\frac{1}{2})$ (1) (1)
31.	Let us assume that 5 - $\sqrt{3}$ is a rational We can find co prime a & b (b≠ 0)such that 5 - $\sqrt{3} = \frac{a}{b}$ Therefore 5 - $\frac{a}{b} = \sqrt{3}$ So we get $\frac{5b-a}{b} = \sqrt{3}$ Since a & b are integers, we get $\frac{5b-a}{b}$ is rational, and so $\sqrt{3}$ is rational. But $\sqrt{3}$ is an irrational number Which contradicts our statement ∴ 5 - $\sqrt{3}$ is irrational **OR** 616 =32 x 19+8 ⇒ r = 8≠0 32 = 8 x 4+0 ⇒ r = 0 The HCF of 32 and 616 is 8.	$(\frac{1}{2})$ (1) $(\frac{1}{2})$ (1) (2) (1)
32.		(1)

	 	(1) (1)
	In ΔOPA and ΔOPB $\angle PAO = \angle PBO$ (each 90°) $OP = OP$(common) $OA = OB$(radii of same circle) $\Delta OPA \cong \Delta OPB$ (by RHS congruency axiom Hence PA = PB (CPCT)	
33.	(i) (6,4) (ii) $\sqrt{(6-3)^2 + (1-4)^2} = 3\sqrt{2}$units (iii) Sita and Rita	(1) (1) (1)
34.	2x + 3y = 11 ----(1) x-2y = -12 ----(2) (2) ⇒ x = 2y -12 ----(3) Substitute value of x from (3) in (1), we get 2(2y -12) +3y = 11 ⇒ 4y – 24 + 3 y = 11 ⇒7y = 35 ⇒y = 5 Substituting value of y = 5 in equation (3), we get x= 2(5) - 12 = 10 - 12 = -2 Hence x = -2, y=5 is the required solution Now 5= -2m +3 ⇒2m = 3-5 ⇒2m = -2 m = -1	(1) (1) (1)
	SECTION - D	
35.	Let two consecutive positive integers be x and $x + 1$	$(\frac{1}{2})$

	$\therefore x^2 + (x+1)^2 = 365$	$(1\frac{1}{2})$
	$\Rightarrow x^2 + x - 182 = 0$ $(x+14)(x-13) = 0$ $\therefore x = 13$ Hence two consecutive positive integers are 13 and 14	(1) (1)
36.	Let common difference be d $\Rightarrow \frac{14}{2}[2(10) + (n-1)d] = 1050$ $\Rightarrow d = 10$ $a_{20} = a + 19d$ $= 10 + 19(10) = 200$ **OR** $a=5$ $a_n = 45$ $S_n = 400$ $\Rightarrow \frac{n}{2}(5+45) = 400$ $50n = 800$ $n = 16$	(2) (2) (2)
	also $a_n = 45$ 5+15d = 45 15d=40 d=8/3	 (2)

37.	 For correct fig InΔADC , $\tan 45^o = \frac{75}{CD}$ 1 = $\frac{75}{CD}$ $\Rightarrow$ CD =75 In ΔADB , $\tan 30^o = \frac{75}{BD}$ $$\frac{1}{\sqrt{3}} = \frac{75}{BD}$$ $\Rightarrow$ BD = $75\sqrt{3}$ $\Rightarrow$Distance between two ships = BC= $75\,(\sqrt{3}-1)$m = 54.9 m	(1) (1) (1) (1)
38.	For correct, Given, To prove, construction and Figure For correct proof **OR** For correct statement, Given, To prove, Construction and Figure	$(4 \times \frac{1}{2} = 2)$ (2) $(5 \times \frac{1}{2} = 2\frac{1}{2})$

	For correct proof	$(1\frac{1}{2})$
39.	A.T. Q. $\pi r^2 \times 1800 \quad = \pi \times \frac{1}{2} \times \frac{1}{2} \times 8$ $\Rightarrow r^2 = \frac{1}{900}$ $\Rightarrow$ r $= \frac{1}{30}$ $\therefore$ Thickness of wire $= \frac{1}{15} cm$ **OR** $\frac{4}{3}\pi r^3 = \pi R^2 h$ $\frac{4}{3}(4.2)^3 = (6)^2 h$ $\Rightarrow h = \frac{2744}{100}$ $\therefore h = 2 \cdot 744\, cm$	(2) $(1\frac{1}{2})$ $(\frac{1}{2})$ (2) $(1\frac{1}{2})$ $(\frac{1}{2})$
40.		

Daily Income	Number of workers	Cumulative Frequency
400-420	12	12
420-440	14	26
440-460	8	34

460-480	6	40
480-500	10	50

Correct Table (2)

Drawing an ogive with co-ordinates (2)

$(420,12), (440,26), (460,34), (480,40), (500,50)$