

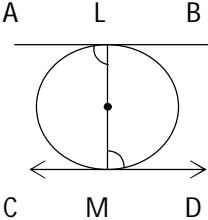
Class - X
Mathematics-Basic (241)
Marking Scheme-SQP 2019-20

Max. Marks: 80

Duration: 3 hrs.

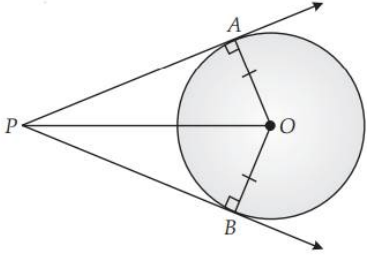
1.	(b) 42	(1)
2.	(a) $2 \text{ Mean} = 3 \text{ Median} - \text{Mode}$	(1)
3.	(d) 70°	(1)
4.	(b) $5^2 \times 13$	(1)
5.	(a) $\frac{1}{26}$	(1)
6.	(d) 4	(1)
7.	(c) 5.010010001...	(1)
8.	(c) 3	(1)
9.	(b) 5 units	(1)
10.	(b) (- 3, 5)	(1)
11.	(2, 3)	(1)
12.	2 OR 1	(1)
13.	1	(1)
14.	0	(1)
15.	4:9	(1)
16.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

	OR	
	cosec A = 17/15	
17.	Area of quadrant = $\frac{1}{4} \times \frac{22}{7} \times r^2 = 38.5$ (use $\pi = \frac{22}{7}$) $\Rightarrow r = 7\text{cm}$ \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.) $\frac{1.5}{3} = \frac{1}{EC}$ $\therefore EC = 2\text{ cm}$	$(\frac{1}{2})$ $(\frac{1}{2})$
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)

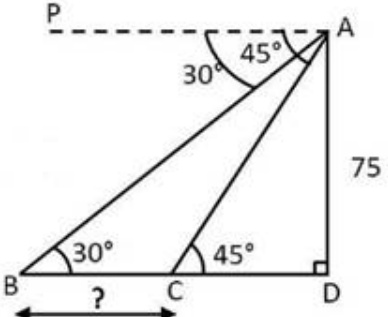
23.	<div style="text-align: center;">  </div> <p style="text-align: center;"> $\angle OLA = 90^\circ$ $\angle OMD = 90^\circ$ $\angle OLA = \angle OMD$ </p> <p>Which are alternate angles, hence $AB \parallel CD$</p>	(1)
		(1)
24.	<p>LHS = $\tan 48^\circ \tan 23^\circ \tan 42^\circ \tan 67^\circ$</p> <p>= $\cot (90^\circ - 48^\circ) \cot (90^\circ - 23^\circ) \tan 42^\circ \tan 67^\circ$</p> <p>= $\cot 42^\circ \cot 67^\circ \tan 42^\circ \tan 67^\circ$</p> <p>= 1</p> <p style="text-align: center;">OR</p> <p>= $\cos 48^\circ \cos 42^\circ - \sin 48^\circ \sin 42^\circ$</p> <p>= $\sin (90^\circ - 48^\circ) \sin (90^\circ - 42^\circ) - \sin 48^\circ \sin 42^\circ$</p> <p>= $\sin 42^\circ \sin 48^\circ - \sin 48^\circ \sin 42^\circ = 0$</p>	(1)
		(1)
25.	<p style="text-align: center;">$r = \frac{7}{2}$</p> <p>Area of Circle = $\frac{\pi r^2}{4} = \frac{77}{2} \text{cm}^2$</p>	(1)
		(1)
26.	<p>(i) 3 Students</p> <p>(ii) $\frac{x^2 + 2x + 1}{x + 1}$</p> <p>= $\frac{(x + 1)^2}{x + 1} = x + 1$</p>	(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 = $120 \times 70 + \pi (35)^2 - [120 \times 56 + \pi (28)^2]$ $= 120 \times 14 + \frac{22}{7} [(35)^2 - (28)^2]$ $= 1680 + \frac{22}{7} \times 7 \times 63$ $= 1680 + 1386$ $= 3066m^2$	(1) $(1\frac{1}{2})$ $(\frac{1}{2})$
30.	L.H.S. = $\frac{\cot A - \cos A}{\cot A + \cos A} = \frac{\frac{\cos A}{\sin A} - \cos A}{\frac{\cos A}{\sin A} + \cos A}$ $= \frac{\cos A (\frac{1}{\sin A} - 1)}{\cos A (\frac{1}{\sin A} + 1)} = \frac{(\frac{1}{\sin A} - 1)}{(\frac{1}{\sin A} + 1)}$ $= \frac{\operatorname{cosec} A - 1}{\operatorname{cosec} A + 1} = \text{R.H.S}$	(1) (1)

	<p>OR</p> $\text{L.H.S.} = \frac{\tan A + \sin A}{\tan A - \sin A} \quad (1)$ $= \frac{\frac{\sin A}{\cos A} + \sin A}{\frac{\sin A}{\cos A} - \cos A} = \frac{\sin A}{\sin A} \frac{[\sec A + 1]}{[\sec A - 1]} \quad \left(\frac{1}{2}\right)$ $= \text{R.H.S} \quad \left(\frac{1}{2}\right)$	<p>(1)</p> <p>(1)</p> <p>(1)</p>
31.	<p>Let us assume that $5 - \sqrt{3}$ is a rational</p> <p>We can find co prime a & b ($b \neq 0$) such that</p> $5 - \sqrt{3} = \frac{a}{b}$ <p>Therefore $5 - \frac{a}{b} = \sqrt{3}$</p> <p>So we get $\frac{5b-a}{b} = \sqrt{3}$</p> <p>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</p> <p>Which contradicts our statement</p> <p>$\therefore 5 - \sqrt{3}$ is irrational</p> <p style="text-align: center;">OR</p> $616 = 32 \times 19 + 8$ $\Rightarrow r = 8 \neq 0$ $32 = 8 \times 4 + 0$ $\Rightarrow r = 0$ <p>The HCF of 32 and 616 is 8.</p>	<p>(1)</p> <p>(1)</p> <p>(1)</p> <p>(1)</p> <p>(2)</p> <p>(1)</p>
32.		(1)

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

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

37.	 <p>For correct fig</p> <p>In $\triangle ADC$, $\tan 45^\circ = \frac{75}{CD}$</p> <p>$1 = \frac{75}{CD} \Rightarrow CD = 75$</p> <p>In $\triangle ADB$, $\tan 30^\circ = \frac{75}{BD}$</p> $\frac{1}{\sqrt{3}} = \frac{75}{BD}$ <p>$\Rightarrow BD = 75\sqrt{3}$</p> <p>$\Rightarrow$Distance between two ships = $BC = 75(\sqrt{3} - 1)m$</p> <p style="text-align: right;">$= 54.9 \text{ m}$</p>	(1) (1) (1) (1)
38.	<p>For correct, Given, To prove, construction and Figure</p> <p>For correct proof</p> <p style="text-align: center;">OR</p> <p>For correct statement, Given, To prove, Construction and Figure</p>	$(4 \times \frac{1}{2})$ $= 2)$ (2) $(5 \times \frac{1}{2})$ $= 2\frac{1}{2})$

	For correct proof	$(1\frac{1}{2})$												
39.	<p>A.T. Q.</p> $\pi r^2 \times 1800 = \pi \times \frac{1}{2} \times \frac{1}{2} \times 8$ $\Rightarrow r^2 = \frac{1}{900}$ $\Rightarrow r = \frac{1}{30}$ <p>\therefore Thickness of wire = $\frac{1}{15} \text{ cm}$</p> <p style="text-align: center;">OR</p> $\frac{4}{3} \pi r^3 = \pi R^2 h$ $\frac{4}{3} (4.2)^3 = (6)^2 h$ $\Rightarrow h = \frac{2744}{100}$ <p>$\therefore h = 2.744 \text{ cm}$</p>	<p>(2)</p> <p>$(1\frac{1}{2})$</p> <p>$(\frac{1}{2})$</p> <p>(2)</p> <p>$(1\frac{1}{2})$</p> <p>$(\frac{1}{2})$</p>												
40.	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Daily Income</th> <th>Number of workers</th> <th>Cumulative Frequency</th> </tr> </thead> <tbody> <tr> <td>400-420</td> <td>12</td> <td>12</td> </tr> <tr> <td>420-440</td> <td>14</td> <td>26</td> </tr> <tr> <td>440-460</td> <td>8</td> <td>34</td> </tr> </tbody> </table>	Daily Income	Number of workers	Cumulative Frequency	400-420	12	12	420-440	14	26	440-460	8	34	
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 (420,12), (440,26), (460, 34), (480,40), (500,50)			(2)