

**INDIAN SCHOOL MUSCAT**  
**HALF YEARLY EXAMINATION**

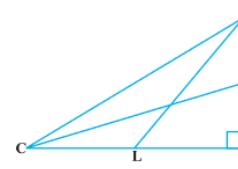
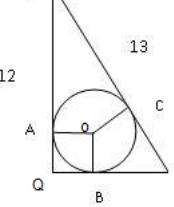
**SET A**

**SEPTEMBER 2019**

**CLASS X**

**Marking Scheme – MATHEMATICS**

Q.NO.	Answers	Marks (with split up)
1.	c) $a=3, b=1$	1
2.	b) -3	1
3.	b) 4cm	1
4.	d) $\cos A$	1
5.	d) 4 m	1
6.	c) $25/4$	1
7.	b) Median	1
8.	d) $70^\circ$	1
9.	a) 5 units	1
10.	c) 4	1
11.	K=3	1
12.	No zero	1
13.	$\frac{32}{48} = \frac{AC}{6}$ AC= 5cm	1
14.	$\sin A = \frac{1}{\operatorname{cosec} A} = \frac{1}{\sqrt{1+\cot^2 A}}$	1
15.	$b^2 - 4ac = -8$ ; no real root	1
16.	3 median = mode + 2 mean	1
17.	PR = 5 + 3 = 8 cm	1
18.	Secant	1
19.	$QR = \sqrt{(-1+5)^2 + (0-4)^2} = 4\sqrt{2}$ units	1
20.	AP:-2, -4, -6, -8	1
21.	$\Delta ABC \sim \Delta RQP$ $\angle C = \angle P = 40^\circ$	1+1
22.	$\sin(A-B)=1/2=\sin 30^\circ \rightarrow A-B=30^\circ$ $\cos(A+B)=\frac{1}{2}=\cos 60^\circ \rightarrow A+B=60^\circ$	$\frac{1}{2}+1/2+1/2+1/2$
	<b>OR</b>	
	$\frac{6\sin 23^\circ + \operatorname{cosec} 11^\circ + \cot 42^\circ}{\operatorname{cosec} 11^\circ + 3 \cot 42^\circ + 6 \sin 23^\circ} = 1$	$\frac{1}{2}+1/2+1/2+1/2$
23.	$-\frac{1}{2}, \frac{2}{3}$	$\frac{1}{2}+1/2+1/2+1/2$
24.	$\text{Mode}=45+\frac{23-18}{2\times 23-18-18}$ $=45+2.5$ $=47.5$	$\frac{1}{2}+1/2+1/2+1/2$
25.	$\sqrt{(10-2)^2 + (y+3)^2} = 10$ $y^2+6y-27=0$ $y=-9; y=3$	$\frac{1}{2}+1/2+1/2+1/2$
	<b>OR</b>	
	Area= 0 $7(2-y)+1(y-0)+x(0-2)=0$	$\frac{1}{2}+1/2+1/2+1/2$

	X+3y=7	
26.	a = 254; n=10; d=-5 $a_{10} = 209$	$\frac{1}{2} + 1/2 + 1/2 + 1/2$
27.	$U=1/2; v=1/3$ $x=4; y=9$	2+1
28.	$X^2+x-20=0$ $x=-5; x=4$	2+1
29.	$\Delta ABD \sim \Delta PQM$ (SSS) $\angle B = \angle Q$ (corres. Parts of $\sim$ $\Delta$ s) $\Delta ABC \sim \Delta PQR$ (SAS)	1+1+1
OR	$BC^2 = AB^2 + AC^2$ (Pythagoras Theorem) $BL^2 = AL^2 + AB^2$ $BL^2 = \left(\frac{AC}{2}\right)^2 + AB^2 \quad (\text{L is the mid-po}$ $BL^2 = \frac{AC^2}{4} + AB^2$ $4 BL^2 = AC^2 + 4 AB^2$ $CM^2 = AC^2 + AM^2$ $CM^2 = AC^2 + \left(\frac{AB}{2}\right)^2 \quad (\text{M is the mid-po}$ $CM^2 = AC^2 + \frac{AB^2}{4}$ $4 CM^2 = 4 AC^2 + AB^2$ $4 (BL^2 + CM^2) = 5 (AC^2 + AB^2)$ $4 (BL^2 + CM^2) = 5 BC^2$	 $\frac{1}{2} \times 6 = 3$
30.	$\begin{aligned} \text{LHS} &= \frac{\cos A}{1+\sin A} + \frac{1+\sin A}{\cos A} \\ &= \frac{\cos^2 A + (1 + \sin A)^2}{(1 + \sin A) \cos A} \\ &= \frac{\cos^2 A + 1 + \sin^2 A + 2 \sin A}{(1 + \sin A) \cos A} \\ &= \frac{1+1+2\sin A}{(1+\sin A) \cos A} \quad [\because \sin^2 A + \cos^2 A = 1] \\ &= \frac{2+2\sin A}{(1 + \sin A) \cos A} \\ &= \frac{2(1+\sin A)}{(1+\sin A) \cos A} = \frac{2}{\cos A} = 2\sec A = \text{RHS} \end{aligned}$	$\frac{1}{2} \times 6 = 3$
31	A= 150; mean = 146.25	$\frac{1}{2} \times 6 = 3$
32.	K=1/3; ratio=1:3 ; y= -3/2	1+1+1
33.	 <p> <math>QA = QB = x</math>; <math>PB = PC = 5 - x</math>; <math>RC = RA = 12 - x</math>  <math>PR = 13 \text{ cm}</math> (Py th)  <math>5 - x + 12 - x = 13</math>  <math>X = 2 \text{ cm}</math>  Also OAQB is a square  Radius = 2 cm </p>	$\frac{1}{2} \times 6 = 3$

OR	<p>From the Figure above, Consider <math>\triangle OPA</math> and <math>\triangle OCA</math>, Here,</p> <ul style="list-style-type: none"> <li>o <math>OP = OC</math> (Radii of the same circle)</li> <li>o <math>AP = AC</math> (Tangents from external point A)</li> <li>o <math>AO = AO</math> (Common side)</li> </ul> <p>Therefore, <math>\triangle OPA \cong \triangle OCA</math> (SSS congruence criterion) Hence, <math>P \leftrightarrow C</math>, <math>A \leftrightarrow A</math>, <math>O \leftrightarrow O</math> We can also say that,  <math>\angle POA = \angle COA</math> ... (i)  Similarly, <math>\triangle OQB \cong \triangle OCB</math>  <math>\angle QOB = \angle COB</math> ... (ii)  Since <math>POQ</math> is a diameter of the circle, it is a straight line.  Therefore, <math>\angle POA + \angle COA + \angle COB + \angle QOB = 180^\circ</math> ..... (3)  Substituting Equation (i) and (ii) in the Equation (3),  <math>2\angle COA + 2\angle COB = 180^\circ</math>  <math>2(\angle COA + \angle COB) = 180^\circ</math>  <math>\angle COA + \angle COB = 90^\circ</math> (By Transposing)  <math>\angle AOB = 90^\circ</math></p>	$\frac{1}{2} \times 6 = 3$																
34.	$d=1/63; a= 1/63; a_{63}= 1$	$1+1+1$																
OR	$S_1=8; S_2=22; S_3= 42$ $a_2= 14; a_3= 20$ $d=6$ A.P: 8, 14, 20..... $a_{15}=92$	$1+1+1$																
35.	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>x</td><td>5</td><td>3</td><td>1</td></tr> <tr><td>Y</td><td>0</td><td>1</td><td>2</td></tr> <tr><td>X</td><td>-2</td><td>1</td><td>4</td></tr> <tr><td>y</td><td>0</td><td>2</td><td>4</td></tr> </table> <p>The line touches the x-axis at (-2,0) and (5,0)</p>	x	5	3	1	Y	0	1	2	X	-2	1	4	y	0	2	4	$3 + 1$
x	5	3	1															
Y	0	1	2															
X	-2	1	4															
y	0	2	4															
36.	$Q= 2x^2-11x-6$ The two more zeroes are 6 and -1/2	$\frac{1}{2} \times 8 = 4$																
37.	Theorem	$1+1+1+1$																
OR	<p>Draw a line <math>OE \parallel AB</math></p> <p>In <math>\triangle ABD</math>, <math>OE \parallel AB</math>  By using basic proportionality theorem, we obtain  <math display="block">\frac{AE}{ED} = \frac{BO}{OD} \quad (1)</math></p> <p>However, it is given that  <math display="block">\frac{AO}{OC} = \frac{OB}{OD} \quad (2)</math></p> <p>From equations (1) and (2), we obtain  <math display="block">\frac{AE}{ED} = \frac{AO}{OC}</math></p> <p><math>\Rightarrow EO \parallel DC</math> [By the converse of basic proportionality theorem]  <math>\Rightarrow AB \parallel OE \parallel DC</math>  <math>\Rightarrow AB \parallel CD</math>  <math>\therefore ABCD</math> is a trapezium.</p>	$1+1+1+1$																

