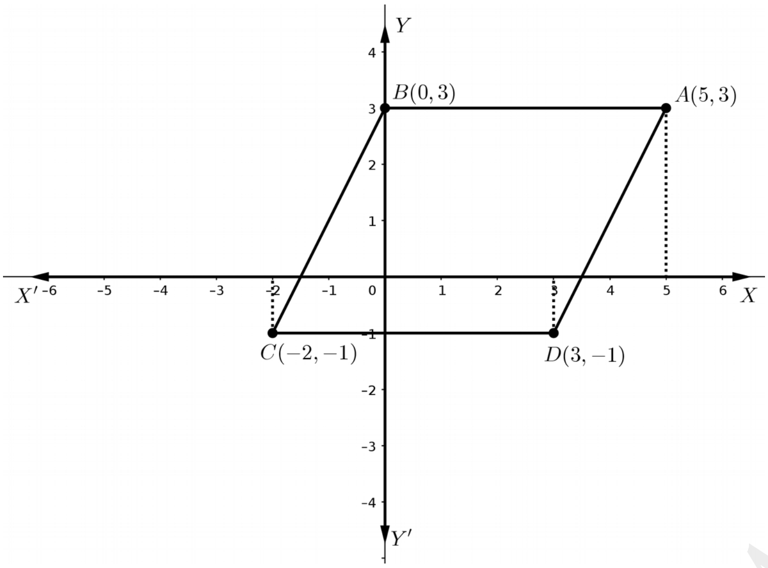
A SUMMATIVE ASSESSMENT - II 2025 – 26

CLASS : X

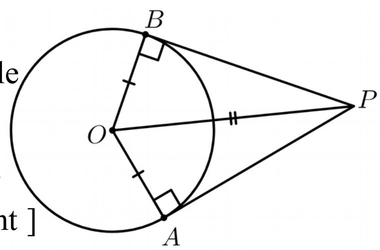
MATHEMATICS -ANSWER KEY

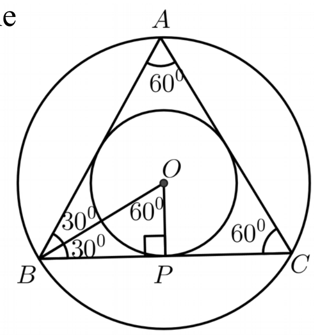
E-1003

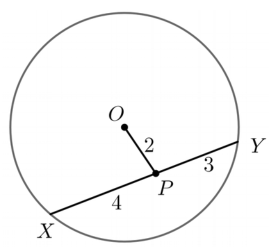
Qn no	Key	Score
	SECTION A	
1	D. –5	1
2	C. (4 , 7)	1
3	B . $2\sqrt{3}$	1
4	C. 70^0	1
5	D. 4	1
6	C. (ii) , (iv)	1
7	C. Both statements are true , Statement II is the reason of statement I .	1
8	C. Both statements are true , Statement II is the reason of statement I .	1
	SECTION B	
9	(i) Probability of it being a white bead $= \frac{12}{20} = \frac{3}{5}$ (ii) Probability of getting a black bead $= \frac{1}{3} = \frac{1 \times 8}{3 \times 8} = \frac{8}{24}$ [The number of black beads do not change] Number of white beads more added = 24 – 20 = 4	1 1 1
10	$3 \times$ common difference = 27 – 23 = 4 (i) $x_5 = x_8 - 3d = 23 - 4 = 19$ OR $x_5 = x_{11} - 6d = 27 - 8 = 19$ (ii) $x_{17} = x_8 + 9d = 23 + 12 = 35$ OR $x_{17} = x_{11} + 6d = 27 + 8 = 35$ (iii) Sum $= 12 \times (x_8 + x_{17}) = 12 \times (23 + 35) = 696$	 1 1 1
	SECTION C	
11	(i) B (6,1) , D (2,4) (ii) Length of the diagonal $= \sqrt{(6-2)^2 + (4-1)^2} = 5$ [AC = BD]	2 1
12	B(4 + 5 – 6 , 3 + 2 – 6) = (3, –1) [BRQP is a parallelogram] C(5 + 6 – 4 , 2 + 6 – 3) = (7,5) [PRCQ is a parallelogram] A(4 + 6 – 5 , 3 + 6 – 2) = (5,7) [PRQA is a parallelogram]	1 1 1
13A	(i) (5,0) , (–5,0) (ii) $\sqrt{(3-0)^2 + (2-0)^2} = \sqrt{13}$ [$\sqrt{13} < \sqrt{25}$] Since the distance from the centre of the circle to the point (3,2) is shorter than the radius, (3,2) is not a point on this circle . (iii) (3,4) [Any of these : (–3,4) ,(3, –4) , (–3, –4) ,(4,3) ,(–4,3) ,(4, –3) , (–4, –3)]	1 1 1 1
13B	OA = OB = 4 (i) $A(2 , 2\sqrt{3})$, $B(-2 , -2\sqrt{3})$ (ii) AB = 8	1 2 1
14	(i) For drawing coordinate axes and marking points . (ii) Area of the quadrilateral ABCD $= 5 \times 4 = 20$ sq.units [ABCD is a parallelogram]	4 1

		
	SECTION D	
15	(i) $1 + 2 + 3 + \ . \ . \ . \ + 30 = \frac{30 \times 31}{2} = 465$ (ii) Sum $= 2 \times \frac{30 \times 31}{2} + (1 \times 30) = (2 \times 465) + 30 = 960$ [$x_n = 2n + 1$ $S_n = 2 \ \frac{n(n+1)}{2} + (1 \times n)$] OR Sum $= 30^2 + (2 \times 30) = 960$ [$x_n = 2n + 1$ $S_n = n^2 + 2n$]	1 2
16A	(i) $x_n = 4n + 6 - 4 = 4n + 2$ (ii) $S_n = 2n^2 + 4n$ $2n^2 + 4n = 880 \ ==> \ n^2 + 2n = 440$ $n^2 + 2n + 1^2 = 440 + 1^2 \ ==> \ (n+1)^2 = 441$ $n + 1 = \sqrt{441} = 21 \ ==> \ n = 20$ [Other methods can be used to find the number of terms]	1 1 1 1

16B	If we take the numbers as $15 + x$ and $15 - x$, then
	$(15 + x)(15 - x) = 216$
	$15^2 - x^2 = 216$
	$x^2 = 9$
	$x = \sqrt{9} = 3$
	Numbers = 18 , 12
	OR
	If we take the numbers as x and $30 - x$, then
	$x(30 - x) = 216$
	$30x - x^2 = 216 \ ==> \ x^2 - 30x = -216$
	$x^2 - 30x + 15^2 = -216 + 15^2$
	$(x - 15)^2 = 9$
	$x - 15 = \sqrt{9} = 3 \ ==> \ x = 18$
	Numbers = 18 , 12
		
		1
		1
		1
		1

<table>
<tr><td>17</td><td>(i) $x^2 - 9x - 36 = (x - 12)(x + 3)$
(ii) $x^2 - 9x = 36 \implies x^2 - 9x - 36 = 0$
$(x - 12)(x + 3) = 0 \implies x - 12 = 0$ OR $x + 3 = 0$
$x = 12$ OR $x = -3$
[Other methods can be used to find the values of x]</td><td>1
1
1
1</td></tr>
<tr><td>18</td><td>If we take the lengths of the perpendicular sides of the right triangle as x cm and x + 7 cm , then
(i) $\frac{1}{2} \times x(x + 7) = 60 \implies x(x + 7) = 60 \times 2 = 120$
$x^2 + 7x = 120 \implies x^2 + 7x - 120 = 0$
$x = \frac{-7 \pm \sqrt{7^2 - 4 \times 1 \times (-120)}}{2 \times 1} = \frac{-7 \pm \sqrt{529}}{2} = \frac{-7 \pm 23}{2}$
$x = \frac{-7 + 23}{2} = 8$ OR $x = \frac{-7 - 23}{2} = -15$
(ii) Lengths of the perpendicular sides = 8 cm , 15 cm.
Hypotenuse $= \sqrt{8^2 + 15^2} = 17$ cm
[We can also take the lengths of the perpendicular sides as x cm and x – 7 cm or can be follow as $x^2 + 7x - 120 = (x + 15)(x - 8)$ or in other methods]</td><td>1
1
1
1
1</td></tr>
<tr><td colspan="3">SECTION E</td></tr>
<tr><td>19A</td><td>In the figure O is the centre of the circle and P is a point outside the circle. The tangents drawn from P to the circle meets the circle at A and B .


$\angle A = \angle B = 90^0$. [The tangent through a point on the circle is perpendicular to the radius through that point]
OA = OB [Radii of a circle are equal]
$\therefore$ From the right triangles OAP and OPB , $PA = \sqrt{OP^2 - OA^2} = \sqrt{OP^2 - OB^2} = PB$</td><td>1
1
1</td></tr>
<tr><td>19B</td><td>In the figure ABC is an equilateral triangle. O is both the centre of the circumcircle and the centre of the incircle of ABC. The incircle touches BC at P .


$\angle P = 90^0$, $\angle OBP = \angle OBA = 30^0$
In right triangle OPB ,
$OB = 2 \times OP$
$\therefore OP = \frac{1}{2} OB$
That is , the radius of the incircle of any equilateral triangle is half the radius of its circumcircle</td><td>1
1
1</td></tr>
<tr><td>20</td><td>$4 \times 3 = r^2 - 2^2$ [$PX \times PY = r^2 - d^2$]
$r^2 - 4 = 12$
$r^2 = 16$
$r = \sqrt{16} = 4\ cm$

</td><td>1
1
1</td></tr>
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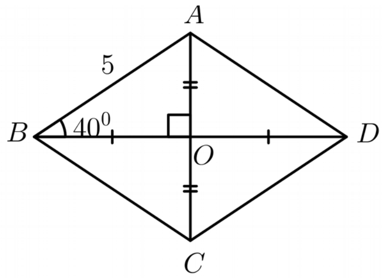
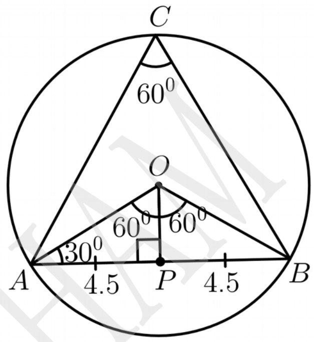
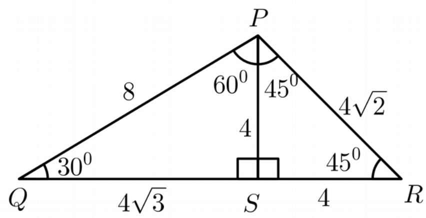
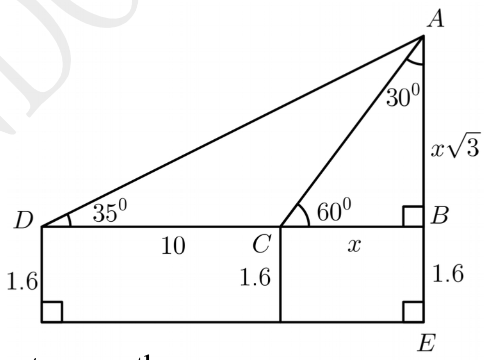
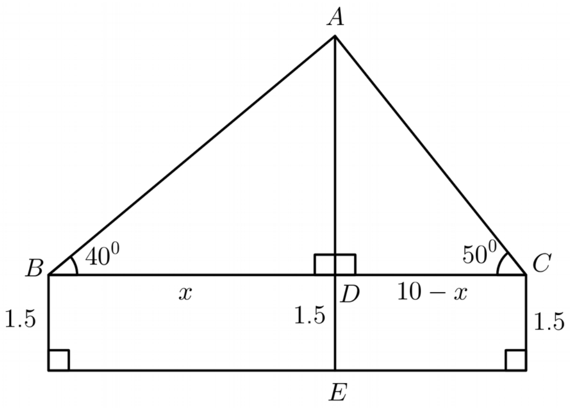
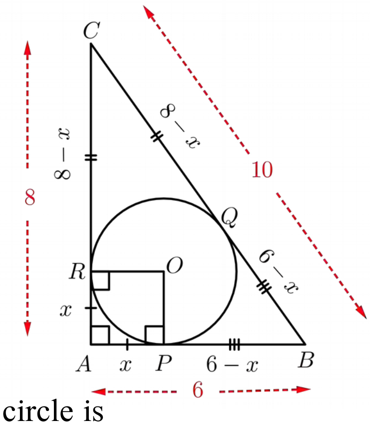
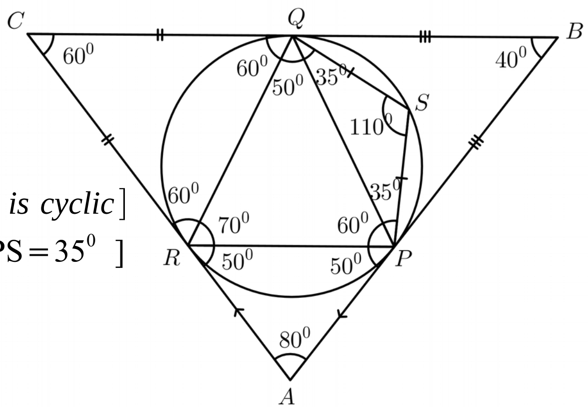
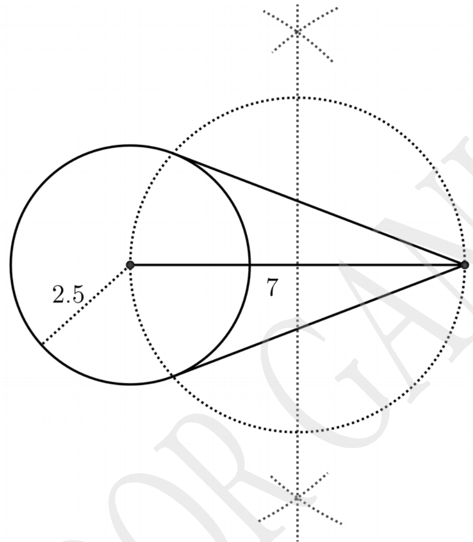
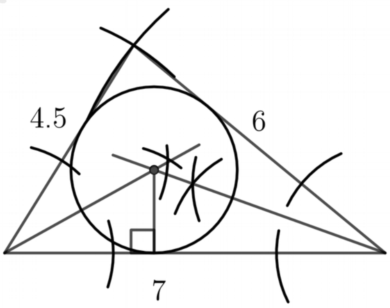
21A	$\angle AOB = 90^0$ (i) OA = 5 X sin40^0 = 5 X 0.6428 cm $[\sin 40^0 = \frac{OA}{5}]$ OB = 5 X cos40^0 = 5 X 0.7660 cm $[\cos 40^0 = \frac{OB}{5}]$ (ii) AC = 2 X OA = 2 X 5 X 0.6428 = 6.428 cm BD = 2 X OB = 2 X 5 X 0.7660 = 7.660 cm  	1 1 1
21B	In the figure O is the centre of the circle and OP is perpendicular to AB. $\therefore$ The central angle of the small arc AB $= 2 \times \angle C = 120^0$ $\angle AOP = \angle BOP = 60^0$ $AP = BP = \frac{9}{2} = 4.5\ cm$ In right triangle OPA , $OA = 4.5 \times \frac{2}{\sqrt{3}} = \frac{9}{\sqrt{3}} = 3\sqrt{3}\ cm$ OR $2r \sin 60^0 = 9$ $2r \times \frac{\sqrt{3}}{2} = 9$ $r \times \sqrt{3} = 9$ $r = \frac{9}{\sqrt{3}} = 3\sqrt{3}\ cm$  	1 1 1
22	(i) PS = 4 cm (ii) RS = 4 cm , $QS = 4\sqrt{3}$ cm Area of the triangle PQR $= \frac{1}{2} \times (4\sqrt{3} + 4) \times 4$ $= 8\sqrt{3} + 8\ sq.cm$  	1 1 1
23A	(i)  (ii) If we take $BC = x\ metres$, then In right triangle ABC , $AB = x\sqrt{3}\ m$ In right triangle ABD , $\tan 35^0 = \frac{x\sqrt{3}}{10 + x}$ $(10 + x)0.7002 = x\sqrt{3}$ ==> $7.002 + 0.7002 \times x = x\sqrt{3}$ $x = \frac{7.002}{\sqrt{3} - 0.7002}$ $\therefore$ Height of the flag post = AE = AB + 1.6 = $\left(\frac{7.002}{\sqrt{3} - 0.7002} \times \sqrt{3}\right) + 1.6\ m$	1 1 1 1 1 1

23B	(i)	
		1
	(ii) If we take $BD = x \ metres$, then $CD = 10 - x \ metres$.	1
	In right triangle ABD , $\tan 40^0 = \dfrac{AD}{x}$ ==> $AD = x \times \tan 40^0$	
		1
	In right triangle ADC , $\tan 50^0 = \dfrac{AD}{10-x}$ ==> $AD = (10-x) \times \tan 50^0$	
	$\therefore$ $x \times \tan 40^0 = (10-x) \times \tan 50^0$ ==> $x \times \tan 40^0 + x \times \tan 50^0 = 10 \ \tan 50^0$	
	$x(\tan 40^0 + \tan 50^0) = 10 \ \tan 50^0$ ==> $x = \dfrac{10 \ \tan 50^0}{\tan 40^0 + \tan 50^0}$	1
	The height of the electric post = AD + 1.5	
	$= \left(\dfrac{10 \ \tan 50^0}{\tan 40^0 + \tan 50^0} \times \tan 40^0\right) + 1.5$	
	$= \left(\dfrac{10 \ \tan 50^0 \times \tan 40^0}{\tan 40^0 + \tan 50^0}\right) + 1.5$	1
	$= \left(\dfrac{10 \times 1.1918 \times 0.8391}{0.8391 + 1.1918}\right) + 1.5 \ m$	
24A	(i) If we take $PA = x \ cm$, then	
		
	$PA = RA = x \ cm$	
	$RC = QC = 8 - x \ cm$	
	$PB = QB = 6 - x \ cm$	
	$8 - x + 6 - x = 10$ ==> $14 - 2x = 10$	1
	$2x = 4$ ==> $x = 2$	1
	$PA = 2 \ cm$, $PB = 6 - 2 = 4 \ cm$,	
	$RC = 8 - 2 = 6 \ cm$	1
	(ii) $\angle P = \angle R = 90^0$ [The tangent through a point on the circle is perpendicular to the radius through that point]	
	$\therefore$ $\angle O = 90^0$ [$\angle A = \angle P = \angle R = 90^0$]	1
	So APOR is a rectangle .	
	Since PA = RA , APOR is a square.	1
	OR	
	(i) $s = \dfrac{6 + 8 + 10}{2} = 12$	
	$PA = RA = s - BC = 2 \ cm$	
	$RC = QC = s - AB = 6 \ cm$	
	$PB = QB = s - AC = 4 \ cm$	

24B	$\angle CRQ = \angle CQR = 60^0$ [CR = CQ] (i) $\angle RPQ = 60^0$ (ii) $\angle ARP = \angle APR = 50^0$ $\angle RAP = 80^0$ (iii) $\angle PSQ = 110^0$ [$\angle PRQ = 70^0$, $PSQR$ *is cyclic*] $\angle SQR = 85^0$ [PS = QS , $\angle PQS = \angle PS = 35^0$] $\angle QRP = 70^0$ $\angle RPS = 95^0$ 	 1 1 1 1 1
25	For drawing a circle of radius 2.5 cm and mark a point 7 centimetres away from the centre. For drawing a large circle with this line as diameter. For drawing lines from the outside point to the point of intersection of these circles. 	1 1 1
26	For drawing the triangle using the given measures. For drawing the bisectors of the angles of the triangle. For taking the perpendicular distance from the point of intersection of the bisectors of the angles of the triangle as radius and drawing the circle. 	1 2 1
27	(i) $6 \times 4 = PC^2$ [$PA \times PB = PC^2$] $PC = \sqrt{24} = 2\sqrt{6}\ cm$ (ii) For drawing the rectangle with given measures. For extending a side by joining its adjacent side. For drawing a circle with this line as diameter. For completing the square.	 1 1 1 1 1

[We can draw this in two different ways as shown below]