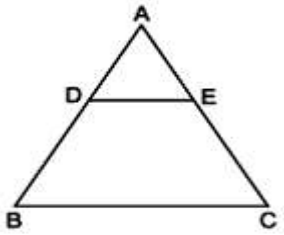
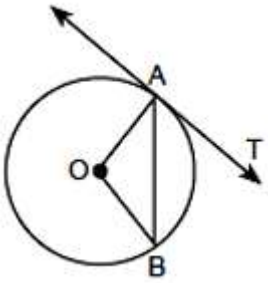
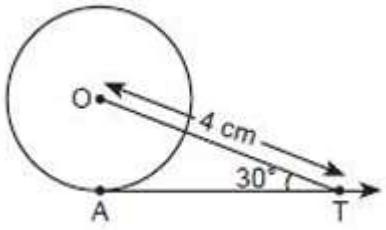
KENDRIYA VIDYALAYA ERANAKULAM REGION
PRE BOARD EXAMINATION
MATHEMATICS
CLASS X SESSION 2026-27

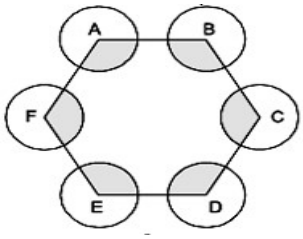
MM- 80 **Time-3 Hrs**

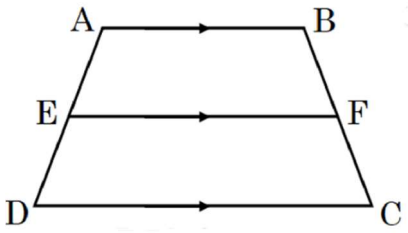
General Instructions:

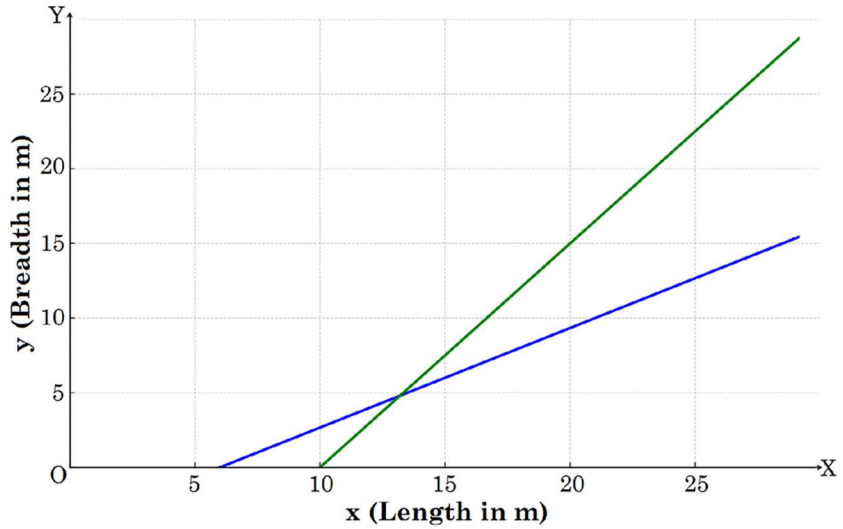
- This Question Paper has 5 Sections A, B, C, D, and E.
- Section A has 20 Multiple Choice Questions (MCQs) carrying 1 mark each.
- Section B has 5 Short Answer-I (SA-I) type questions carrying 2 marks each.
- Section C has 6 Short Answer-II (SA-II) type questions carrying 3 marks each.
- Section D has 4 Long Answer (LA) type questions carrying 5 marks each.
- Section E has 3 Case Based integrated units of assessment (4 marks each)

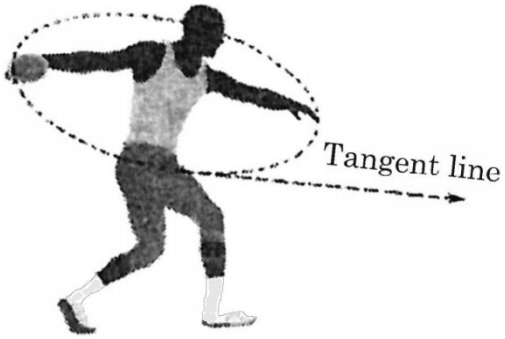
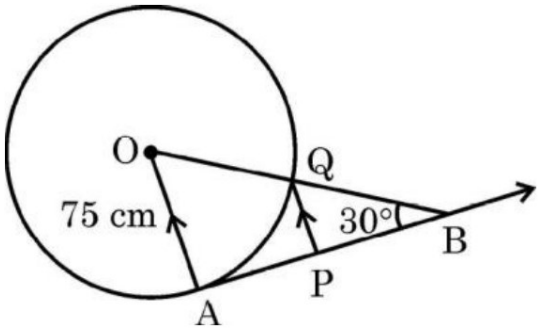
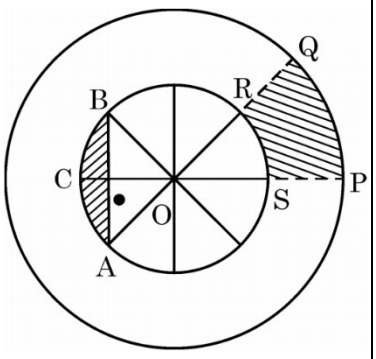
Q NO.	**SECTION – A** **(Section A consists of 20 questions of 1 mark each)**	Marks
1	. If two positive integers a and b are written as $a = x^3y^2$ and $b = xy^3$, where x and y are prime numbers, then the HCF (a, b) is: (a) xy (b) xy^2 (c) x^3y^3 (d) x^2y^2	1
2	The quadratic polynomial, the sum of whose zeroes is –5 and their product is 6, is (a) $x^2 + 5x + 6$ (b) $x^2 – 5x + 6$ (c) $x^2 – 5x – 6$ (d) $–x^2 + 5x + 6$	1
3	The value of k for which the system of equations $x + y – 4 = 0$ and $2x + ky = 3$, has no solution, is (a) – 2 (b) $\neq 2$ (c) 3 (d) 2	1
4	If P (2, p) is the mid-point of the line segment joining the points A (6, –5) and B (–2, 11), find the value of p. (a) 5 (b) 2 (c) 3 (d) 4	1
5	If p – 1, p + 3, 3p – 1 are in AP, then p is equal to _____. (a) 3 (b) 4 (c) 2 (d) none of these	1
6	. If the roots of $ax^2 + bx + c = 0$ are equal in magnitude but opposite in sign, then (a) a = 0 (b) b = 0 (c) c = 0 (d) none of these	1
7	If the distance between the points (4, p) and (1, 0) is 5 units, then the value of p is (a) 4 only (b) ± 4 (c) –4 only (d) 0	1

8	If in two triangles ABC and DEF, $\frac{AB}{DE} = \frac{BC}{FD}$ (a) ∠B = ∠E (b) ∠A = ∠D (c) ∠B = ∠D (d) ∠A = ∠F	1
9	. In figure DE || BC. If BD = x – 3, AB = 2x. CE = x – 2 and AC = 2x + 3. Find x.  (a) 9 (b) 4 (c) 3 (d) 5	1
10	If $\sqrt{3}\sin\theta - \cos\theta = 0$ and $0° < \theta < 90°$, find the value of θ. (a) 30° (b) 45° (c) 60° (d) 90°	1
11	In figure, O is the centre of a circle, AB is a chord and AT is the tangent at A. If ∠AOB = 100° then ∠BAT is equal to  (a) 50° (b) 40° (c) 100° (d) 60°	1
12	If cosecA – cotA = $\frac{4}{5}$, then cosec A = (a) $\frac{47}{40}$ (b) $\frac{59}{40}$ (c) $\frac{51}{40}$ (d) $\frac{41}{40}$	1
13	The angle of depression of a car, parked on the ground, from the top of a 75 m high tower, is 30°. The distance of the car from the base of the tower (in m) is: (a) 25 $\sqrt{3}$ (b) 50 $\sqrt{3}$ (c) 150 (d) 75$\sqrt{3}$	1
14	Volumes of two spheres are in the ratio 64: 27. The ratio of their surface areas is (a) 3: 4 (b) 4: 3 (c) 9: 16 (d) 16: 9	1
15	In the below figure AT is a tangent to the circle with centre O such that OT = 4 cm and ∠OTA = 30°. Then AT is equal to  (a) 4 cm (b) 2 cm (c) 2$\sqrt{3}$ cm (d) 4$\sqrt{3}$ cm	1
16	The number of revolutions made by a circular wheel of radius 0.7 m in rolling a distance of 176 m is (a) 40 (b) 24 (c) 75 (d) 22	1

17	If $\sin\theta - \cos\theta = 0$, then the value of $(\sin^4\theta + \cos^4\theta)$ is (a) 1 (b) $\frac{1}{2}$ (c) $\frac{3}{4}$ (d) $\frac{1}{4}$	1
18	A ladder 15 m long just reaches the top of a vertical wall. If the ladder makes an angle of 60° with the wall, then the height of the wall is (a) 15 √3 m (b) 15 m (c) 15√3 /2 m (d) 15/2 m	1
	A statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as: (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A). (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A). (c) Assertion (A) is true but reason (R) is false. (d) Assertion (A) is false but reason (R) is true.	
19	Assertion (A): A quadratic polynomial has two real zeroes. Reason (R): A quadratic polynomial can have at the most two zeroes.	1
20	**Assertion (A):** The point (–1, 6) divides the line segment joining the points (–3, 10) and (6, –8) in the ratio 2: 7 internally. **Reason (R):** Given three points, i.e. A, B, C form an equilateral triangle, then AB = BC = AC.	1
	SECTION – B **(Section B consists of 5 questions of 2 marks each)**	
21	On a morning walk three persons step off together and their steps measure 40 cm, 42 cm, 45 cm, what is the minimum distance each should walk so that each can cover the same distance in complete steps?	2
22	If the point C (–1, 2) divides the line segment AB in the ratio 3: 4, where the coordinates of A are (2, 5), find the coordinates of B.	2
23	A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.	2
24	Find the value of x if $\tan 3x = \sin 45°.\cos 45° + \sin 30°$.	2
25	ABCDEF is any hexagon with different vertices A, B, C, D, E and F as the centers of circles with same radius r are drawn. The area of the shaded portion is  Or The minute hand of a clock is 21 cm long. Find the area described by the minute hand on the face of the clock between 7.00 am and 7.05 am. [Use $\pi = \frac{22}{7}$]	2

	SECTION – C **(Section C consists of 6 questions of 3 marks each)**	
26	Prove that $\sqrt{2}+\sqrt{3}$ is irrational.	3
27	Ifα and β are the zeroes of the polynomial x^2-6x+a,find the value of a, if $3\propto+2\beta=20$.	3
28	Split 207 into three parts such that these are in AP and the product of the two smaller parts is 4623. OR If sum of first 6 terms of an AP is 36 and that of the first 16 terms is 256, find the sum of first 10 terms.	3
29	The line joining the points (2, 1) and (5, 8) is trisected by the points P and Q. If the point P lies on the line $2x-y+k=0$,find the value of k.	3
30	In the given figure, if ABCD is a trapezium in which AB|| EF|| DC, then prove that $\frac{AE}{ED}=\frac{BF}{FC}$.  	3
31	Show that $\tan^4\theta+\tan^2\theta=\sec^4\theta-\sec^2\theta$. OR Prove that $(\sin^4\theta-\cos^4\theta+1)\operatorname{cosec}^2\theta=2$	3
	SECTION – D **(Section D consists of 4 questions of 5 marks each)**	
32	At present, Kavita's age in years is 2 more than the square of her daughter, Nisha's age. When Nisha grows to her mother's present age, Kavita's age would be 1 year less than 10 times the present age of Nisha. Find the present ages of both Nisha and Kavita.	5
33	Through the mid-point M of the side CD of a parallelogram ABCD, the line BM is drawn intersecting AC in L and AD (produced) in E. Prove that EL= 2BL .	5
34	The angle of elevation of the top of a building from the foot of a tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 45°. If the tower is 30 m high, find the height of the building. OR A man in a boat rowing away from a light house 100 m high takes 2 minutes to change the angle of elevation of the top of the light house from 60° to 30°. Find the speed of the boat in meters per minute.	5

35	A wall 24 m long, 0.4 m thick and 6 m high is constructed with the bricks each of dimensions 25 cm × 16 cm × 10 cm. If the mortar occupies $\frac{1}{10}$ th of the volume of the wall, then find the number of bricks used in constructing the wall. OR 16 glass spheres each of radius 2 cm are packed into a cuboidal box of internal dimensions 16 cm × 8 cm × 8 cm and then the box is filled with water. Find the volume of water filled in the box.	5
	SECTION – E **(Case study-based questions)**	
36	**Case study – 1** The management committee of a residential colony decided to construct a community center on a rectangular plot of land. In a planning meeting, one of the members shared some estimates. • He mentioned that if the length of the land (x) is increased by 3 meters and the breadth of the land (y) is decreased by 2 meters, the total area decreases by 18 square meters. • On the other hand, if the length of the land (x) is reduced by 2 meters and the breadth of the land (y) is increased by 3 meters, the area increases by 24 square meters. The following graph shows the linear equations representing the given conditions.  Based on the above information, answer the questions given below. (i) Find the pair of equations, which correctly represents the above conditions? (ii) What type of lines do the above equations obtained in (i) represent on the graph? (iii) (a) The graphs of the two equations intersect at one point. Find this point, using substitution method. OR (b) What are the actual dimensions of the rectangular land selected for the community center?	1 1 2

37	The discus throw is an event in which an athlete attempts to throw a discus. The athlete spins anti-clockwise around one and a half times through a circle, then releases the throw. When released, the discus travels along tangent to the circular spin orbit.   In the given figure, AB is one such tangent to a circle of radius 75 cm. Point O is centre of the circle and $\angle ABO = 30^{\circ}$. PQ is parallel to OA. Based on the above information, (i) find the length of AB. (ii) find the length of OB. (iii) find the length of AP. **OR** (iii) find the length of PQ.	 1 1 2
38	NSS (National Service Scheme) aims to connect the students to the community and to involve them in problem solving process.NSS symbol is based on the 'Rath' wheel of the Konark Sun Temple situated in Odisha. The wheel signifies the progress cycle of life. The diagrammatic representation of the symbol is given below. Observe the figure given here. The diameters of inner circle are equally placed. Given that $OP = 21$ cm, $OS = 10$ cm.  Based on the above information, answer the following questions. (i) Find m $\angle ROS$. (ii) Find the perimeter of sector OPQ. (iii) Find the area of shaded region PQRS. **OR** (iii) Find the area of the shaded region ACB i.e., the segment ACB	 1 1 2