



**COMMON PRE-BOARD EXAMINATION**  
**MATHEMATICS (BASIC)–Code No. 041**



**CLASS-X-(2025-26)**

**SET: 2**

**Time allowed: 3 Hrs.**

**Maximum Marks: 80**

**General Instructions:**

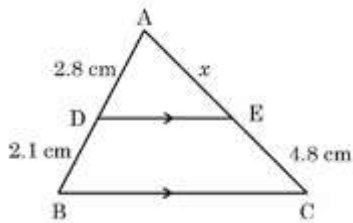
Read the following instructions carefully and follow them:

1. This question paper contains 38 questions. All Questions are compulsory.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Question numbers 1-18 are multiple choice questions (MCQs) and question no.19 and 20 are Assertion- Reason based questions of 1 mark each.
4. In Section B, Question numbers 21-25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Question numbers 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Question numbers 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Question numbers 36-38 are case study-based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. There is no overall choice. However, an internal choice in 2 questions of Section B, 2 questions of Section C and 2 questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required. Take  $\pi = \frac{22}{7}$  wherever required if not stated.
10. Use of calculators is not allowed.

Q. No.	Questions	Marks
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**SECTION A**

- |    |  |   |
|----|--|---|
| 1. | If two circles touch externally, then the distance between their centres is equal to:<br>(A) Sum of their radii                      (B) difference of their radii<br>(C) Product of their radii                      (D) average of their radii | 1 |
| 2. | The discriminant of the quadratic equation $x^2 - 4x + 3 = 0$ is :<br>(A) -4                      (B) 28                      (C) 4                      (D) - 8   | 1 |
| 3. | The region between a chord and either of the two arcs of a circle is called :<br>(A) an arc                      (B) a sector                      (C) a segment                      (D) a semicircle   | 1 |
| 4. | If in the given figure, $DE \parallel BC$ . If $AD = 2.8$ cm, $DB = 2.1$ cm and $EC = 4.8$ cm, then the value of $x$ is :  | 1 |

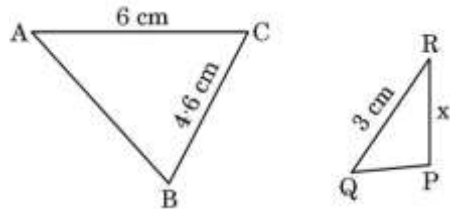


- (A) 3.6cm                      (B) 2.4 cm                      (C) 6.4cm                      (D) 4.8 cm

5. The LCM of 24, 36 and 60 in terms of their prime factors is : 1

- (A)  $2^2 \times 3 \times 5$                       (B)  $2^3 \times 3^2$                       (C)  $2^3 \times 3^2 \times 5$                       (D)  $2^3 \times 3^3 \times 5$

6. In the given figure, if  $\Delta ABC \sim \Delta QPR$ , then the value of  $x$  is : 1



- (A) 5.3cm                      (B) 2.3 cm                      (C) 4.6 cm                      (D) 4 cm

7. Which term of the A.P.  $-29, -26, -23, \dots, 61$  is 16? 1

- (A) 11<sup>th</sup>                      (B) 16<sup>th</sup>                      (C) 10<sup>th</sup>                      (D) 31<sup>st</sup>

8. If  $C(1, -1)$  is the mid-point of the line segment AB joining points  $A(4, x)$  and  $B(-2, 4)$ , then value of  $x$  is : 1

- (A) 6                      (B) -6                      (C) 3                      (D) -5

9. The difference of the areas of a minor sector of angle  $120^\circ$  and its corresponding major sector of a circle of radius 21cm, is 1

- (A)  $231\text{cm}^2$                       (B)  $462\text{cm}^2$                       (C)  $346.5\text{cm}^2$                       (D)  $693\text{cm}^2$

10. If the probability of a player winning a game is 0.79, then the probability of his losing the same game is: 1

- (A) 1.79                      (B) 0.31                      (C) 0.79                      (D) 0.21

11. If  $\cos \theta = \frac{p}{q}$ , then  $\sin \theta$  is equal to : 1

- (A)  $\frac{q}{\sqrt{q^2-p^2}}$                       (B)  $\frac{p}{\sqrt{q^2-p^2}}$                       (C)  $\frac{\sqrt{q^2-p^2}}{q}$                       (D)  $\frac{q}{p}$

12. The distance between the points  $(2, -1)$  and  $(-1, -5)$  is : 1

- (A) 5 units                      (B) 15 units                      (C) 25 units                      (D) 41 units

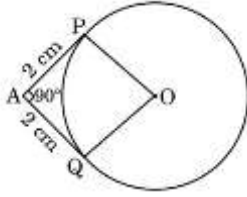
13. The following distribution gives the daily income of 50 workers of a factory : 1

Income(₹)	400-424	425-449	450-474	475-499	500-524
No. of workers	12	14	8	6	10

The lower limit of the modal class is:

- (A) 425                      (B) 449                      (C) 424.5                      (D) 425.5

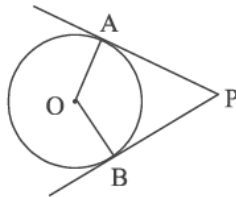
14. AP and AQ are tangents drawn from an external point A to a circle with centre O and inclined to each other at an angle of  $90^\circ$ . If the length of each tangent is 2 cm, then the radius of the circle is : 1



- (A) 4 cm      (B)  $2\sqrt{2}$  cm      (C) 2cm      (D) 1cm
15. Which of the following equations has 2 as a root? 1
- (A)  $x^2 - 4x + 5 = 0$       (B)  $x^2 + 3x - 12 = 0$   
 (C)  $2x^2 - 7x + 6 = 0$       (D)  $3x^2 - 6x - 2 = 0$
16. The mean and median of a statistical data are 21 and 23 respectively. The mode of the data is: 1
- (A) 27      (B) 22      (C) 17      (D) 23
17. If a polynomial  $p(x)$  is given by  $p(x) = x^2 - 5x + 6$ , then the value of  $p(1) + p(4)$  is:? 1
- (A) 0      (B) 4      (C) 2      (D) -4
18. The common difference of an A.P, whose  $n$ th term is given by  $a_n = 5n - 1$ , is : 1
- (A) 1      (B) 6      (C) 5      (D) 4

Question numbers 19 and 20 are Assertion and Reason based questions. Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the options (A), (B), (C) and (D) as given below.

- (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):** The probability of getting exactly one head in tossing a pair of coins is  $\frac{1}{2}$ . 1  
**Reason (R):** The sample space of two coin tossed is = {HH, TT, HT, TH} = 4
20. **Assertion (A):** If PA and PB are tangents drawn to a circle with centre O from an external point P, then the quadrilateral OAPB is a cyclic quadrilateral. 1  
**Reason (R):** In a cyclic quadrilateral opposite angles are equal.



### SECTION B

21. Find the zeroes of the quadratic polynomial  $6x^2 - 7x - 3$  and verify the relationship between the zeroes and the coefficients of the polynomial. 2
22. (A) Using prime factorization, find the HCF and LCM of 6, 72 and 120. 2

**OR**

- (B) There is a circular path around a sports field. Three cyclists start from the same point and at the same time and go in the same direction. If they take 30 minutes, 40 minutes and 48 minutes respectively to complete one round of the field, after how many minutes will they meet again at the starting point?
23. Prove that the tangents drawn at the end of a diameter of a circle are parallel. 2
24. (A) Evaluate:  $\sin A \cos B + \cos A \sin B$ ; if  $A=30^\circ$  and  $B = 45^\circ$  2

**OR**

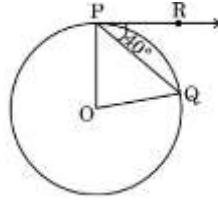
- (B) Evaluate:  $\sin^2 30^\circ + \cos^2 45^\circ - \cos 0^\circ \times \tan 45^\circ$
25. The product of two consecutive positive integers is 306. Find the integers using quadratic formula. 2

### SECTION C

26. Find the sum of all integers between 50 and 500 which are divisible by 7 3
27. Show that  $\sqrt{2} - \sqrt{5}$  is an irrational number. 3
28. Prove that:  $(\sin \theta + \operatorname{cosec} \theta)^2 + (\cos \theta + \sec \theta)^2 = 7 + \tan^2 \theta + \cot^2 \theta$  3
29. The following frequency distribution table gives the monthly consumption of electricity of 70 consumers of a locality. Find the median of the data. 3

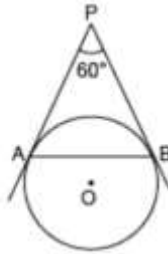
Monthly Consumption (in units)	Number of consumers
65 - 85	7
85 - 105	8
105 - 125	7
125 - 145	20
145 - 165	14
165 - 185	9
185 - 205	5

30. (A) If  $O$  is the centre of a circle,  $PQ$  is a chord and the tangent  $PR$  at  $P$  makes an angle of  $40^\circ$  with  $PQ$ , then find the measure of  $\angle POQ$ . 3



**OR**

- (B) In figure  $AP$  and  $BP$  are tangents to a circle with centre  $O$  such that  $AP = 5\text{cm}$  and  $\angle APB = 60^\circ$ , find the length of chord  $AB$ .



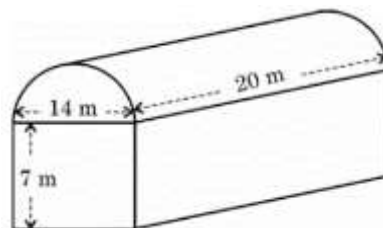
31. (A) The area of a rectangle get reduced by 9 square units, if its length is reduced by 5 units and breadth is increased by 3 units. If we increase the length by 3 units and breadth by 2 units, the area increases by 67 square units. Find the dimension of the rectangle 3

**OR**

- (B) Draw a graph of the equation  $x - y + 1 = 0$  and  $3x + 2y - 12 = 0$ . Determine the coordinates of the vertices of the triangle formed by these lines.

### SECTION D

32. A statue, 1.6 m tall, stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is  $60^\circ$  and from the same point, the angle of elevation of the top of the pedestal is  $45^\circ$ . Find the height of the pedestal. (Use  $\sqrt{3} = 1.732$ ) 5
33. (A) A textile industry runs in a shed. This shed is in the shape of a cuboid surmounted by a half cylinder. If the base of the industry is of dimensions  $14\text{m} \times 20\text{m}$  and the height of the cuboidal portion is 7m, find the volume of air that the industry can hold. Further, suppose the machinery in the industry occupies a total space of  $400\text{m}^3$ . Then, how much space is left in the industry? 5



**OR**

(B) A toy is in the form of a cone of radius 7 cm mounted on a hemisphere of same radius.

The total height of the toy is 31 cm. Find the surface area of the toy.

34. (A) A train covers a distance of 300 km at a uniform speed. If the speed of the train is increased by 5 km/hr, it takes 2 hours less in the journey. Find the original speed of the train. 5

**OR**

(B) The ratio of monthly incomes of two persons is 9:7 and the ratio of their expenditures is 4: 3. If each of them manages to save ₹ 2,000 per month, then find their monthly incomes.

35. Prove that a line drawn parallel to one side of a triangle intersecting other two sides in distinct points, divides the other two sides in the same ratio. 5

### SECTION E

36. Family structure: In a recent survey of this year, 51% of the families in the United States of America had no children, 20% had one child, 19% had two children, 7% had three children and 3% had four or more children.



A family is selected at random.

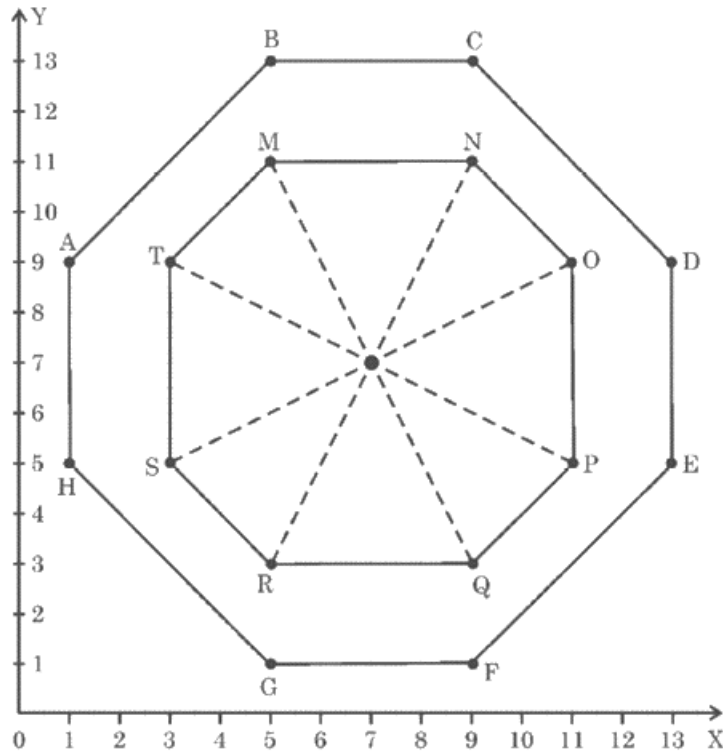
Based on the above information, answer the following questions :

- (i) Find the probability that the selected family has two or three children. 1  
(ii) Find the probability that the selected family has more than two children. 1  
(iii) (A) Find the probability that the selected family has more than one child. 2

**OR**

(iii) (B) Find the probability that the selected family has less than three children.

37. The top of a table is hexagonal in shape.



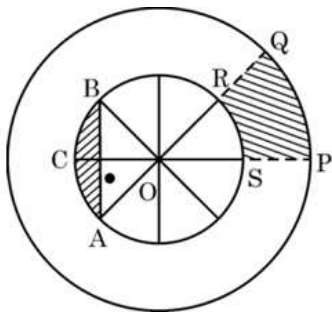
On the basis of the information given above, answer the following questions:

- (i) Write the coordinates of A and B. 1
- (ii) Write the coordinates of the mid-point of line segment joining C and D. 1
- (iii) (A) Find the distance between M and Q. 2

**OR**

- (iii) (B) Find the coordinates of the point which divides the line segment joining M and N in the ratio 1:3 internally.

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 above. 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  $\angle ROS$ .
- (ii) Find the perimeter of sector OPQ. 1
- (iii) (A) Find the area of shaded region PQRS. 1
- OR** 2
- (iii)(B) Find the area of shaded region ACB i.e. the segment ACB.