ICSE MATH

Made Simple

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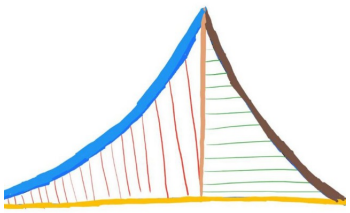

Contents

Introduction

This book links high school coordinate geometry to linear algebra and matrix analysis through solved problems.

Chapter 1

Linear Forms

Chapter 2

Circles

2.1. 2022

2.1.1. 10

1. $ABCD$ is a cyclic quadrilateral. If $\angle BAD = (2x + 5)^\circ$ and $\angle BCD = (x + 10)^\circ$ then x is equal to:

   (a) 65°

   (b) 45°

   (c) 55°

   (d) 5°

2. In the given figure O is the centre of the circle. PQ and PR are tangents and $\angle QPR = 70°$. Calculate:

   (a) $\angle QOR$

   (b) $\angle QSR$

3. Two chords AB and CD of a circle intersect extenally at E. if $EC = 2cm$, $EA = 3cm$ and $AB = 5cm$, find the length of CD.

4. In the given figure A, B, C and D are points on the circle with centre O. Given $\angle ABS = 62°$. Find:

   (a) $\angle ADC$

   (b) $\angle CAB$

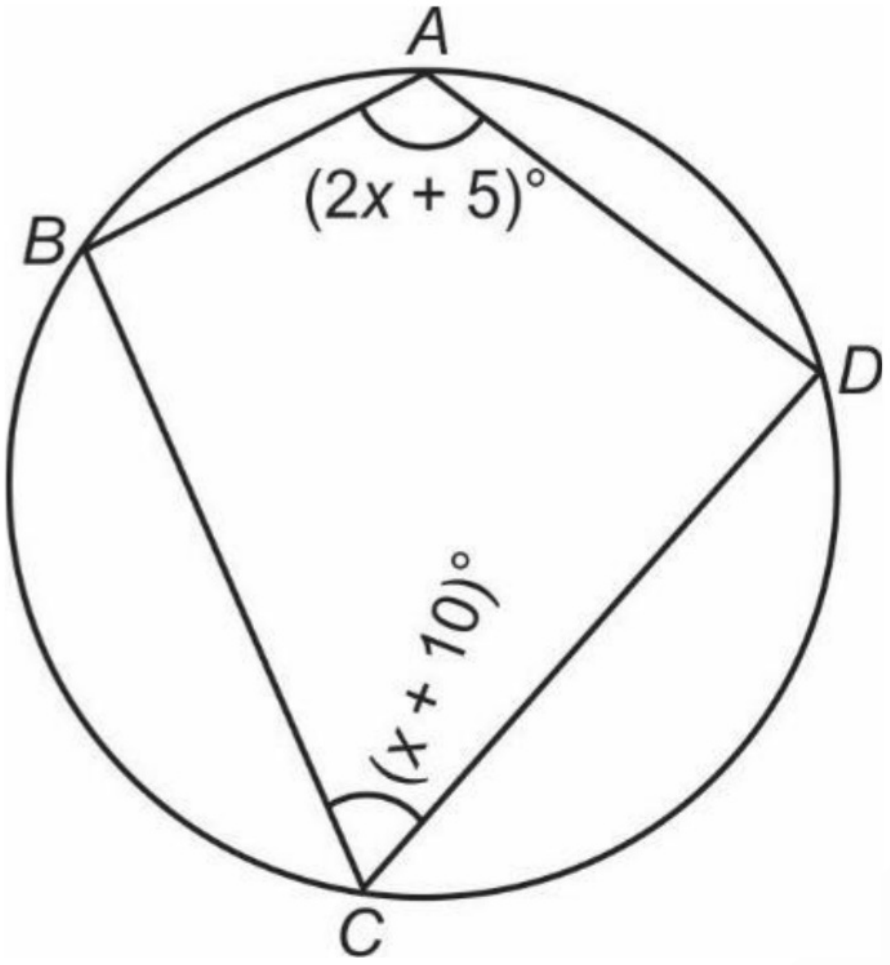

Figure 2.1:

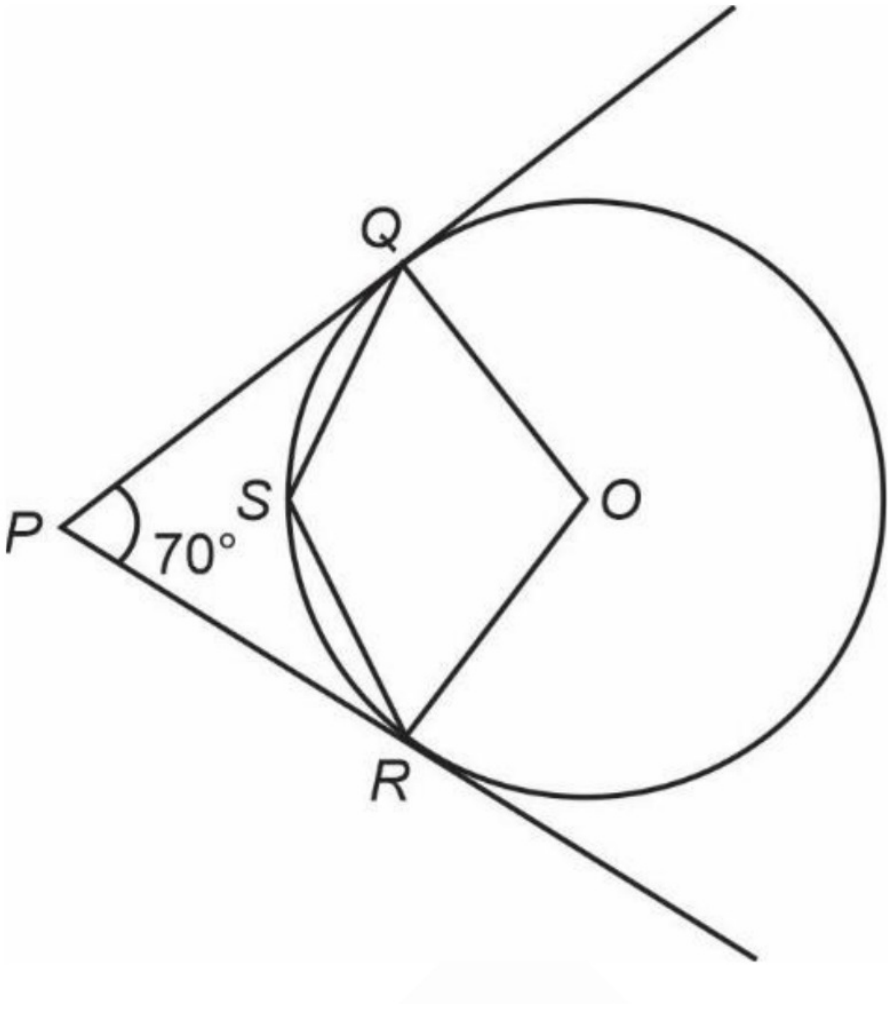

Figure 2.2:

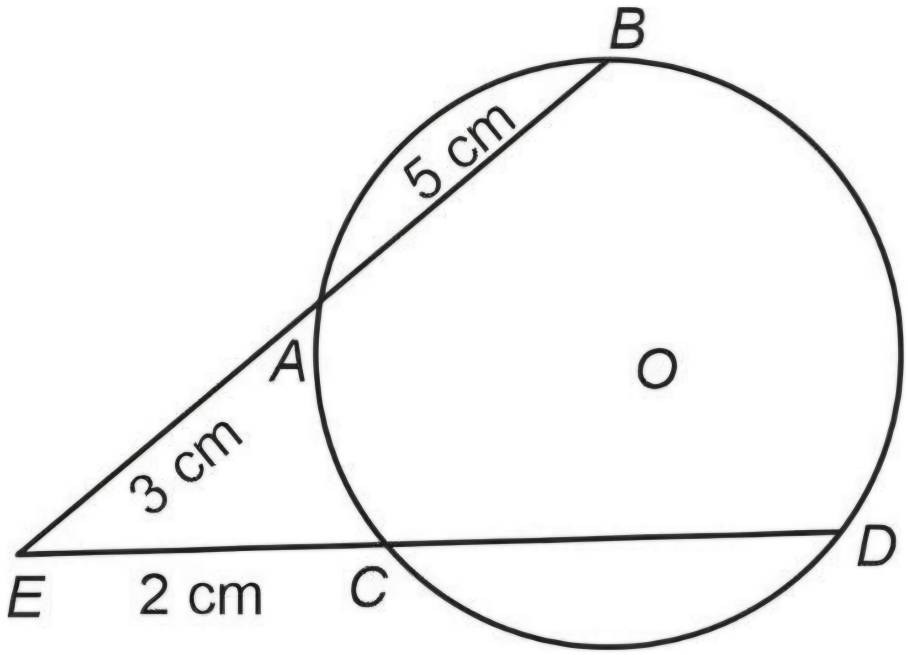

Figure 2.3:

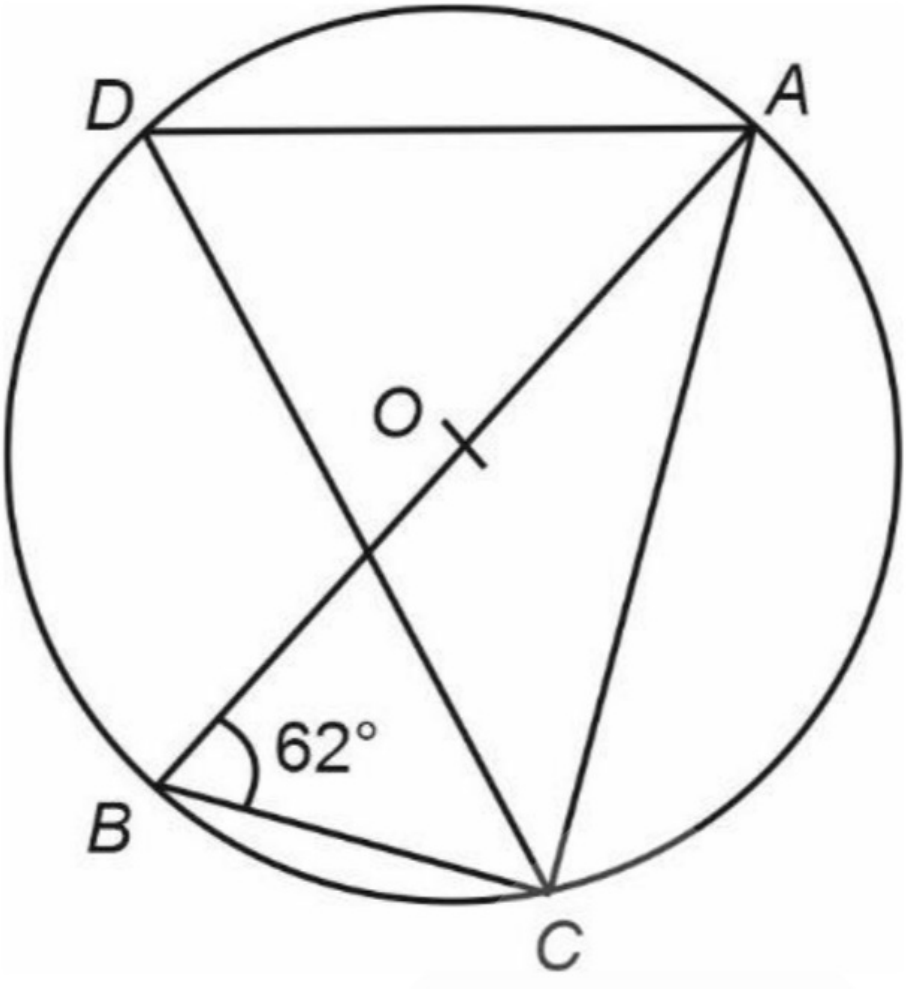

Figure 2.4:

Chapter 3

Intersection of Conics

Chapter 4

Probability

4.1. 2022

4.1.1. 10

1. The probability of getting a number divisible by 3 in throwing a dice is:

   (a) $\frac{1}{6}$

   (b) $\frac{1}{3}$

   (c) $\frac{1}{2}$

   (d) $\frac{2}{3}$

2. A bag contains 5 white, 2 red and 3 black balls. A ball is drawn at random. What is the probability that the ball drawn is a red ball?

3. A letter of the word "$SECONDARY$", is selected at random. What is the probability that the letter selected is not a vowel?

Chapter 5

Construction

Chapter 6

Optimization

Chapter 7

Algebra

Chapter 8

Geometry

8.1. 2022

8.1.1. 10

1. A lighthouse is $80m$ high. The angle of elevation of its top from a point $80m$ away from its foot along the same horizontal line is:

   (a) $60°$

   (b) $45°$

   (c) $30°$

   (d) $90°$

2. Two lamp posts AB and CD each of height $100m$ are on either side of the road. P is a point on the road between the two lamp posts. The angle of elevation of the top of the lamp posts from te point P are $60°$ and $40°$. Finf the distances PB and CD.

Chapter 9

Coordinate Geometry

9.1. 2022

9.1.1. 10

1. If two lines are perpendicular to one another then the relation between their slopes m_1 and m_2 is:

   (a) $m_1 = m_2$

   (b) $m_1 = \frac{1}{m_2}$

   (c) $m_1 = -m_2$

   (d) $m_1 \times m_2 = -1$

2. The coordinates of the point $P(-3, 5)$ on reflecting on the x-axis are:

   (a) $(3, 5)$

   (b) $(-3, -5)$

   (c) $(3, -5)$

   (d) $(-3, 5)$

3. $A(1,4), B(4,1)$ and $C(x,4)$ are the vertices of $\triangle ABC$. If the centroid of the triangle is $G(4,3)$ then x is equal to:

   (a) 2

   (b) 1

   (c) 7

   (d) 4

4. Find $'a'$, if $A(2a+2,3,\ B(7,4)$ ad $C(2a+5,2)$ are collinear.

5. Find a point P which divides internally the line segment joining the points $A(-3,9)$ and $B(1,-3)$ in the ratio $1:3$.

6. Use a graph paper for this question. Take $2cm = 1$ unit along both the axes

   (a) Plot the points $A(0,4), B(2,2), C(5,2)$ and $D(4,0)$. $E(0,0)$ is the origin.

   (b) Reflect B, C, D on the y-axis and name them as B', C', D' respectively.

   (c) Join the points $ABCDD'C'B'$ and A in order and give a geometrical name to the closed figure.

7. Find the equation of a line parallel to the line $2x+y-7=0$ and passi ng through the intersection of the lines $x+y-4=0$ and $2x-y=8$.

8. Line AB is perpendicular to CD. Coordinates of $B, CandD$ are respectively $(4,0),(0,-1)$ and $(4,3)$. Find:

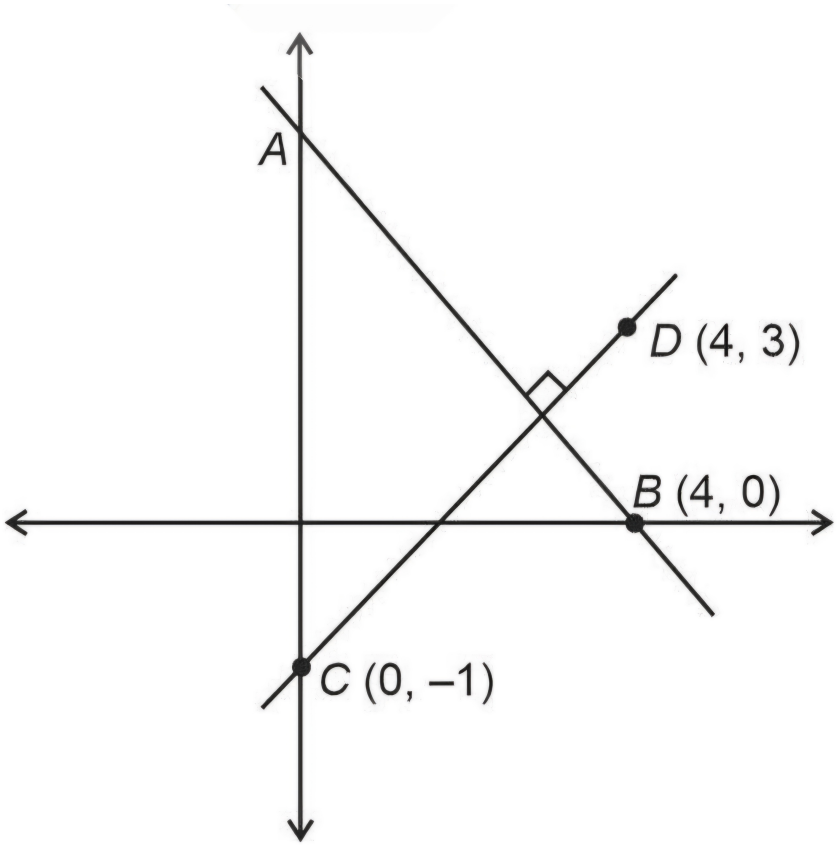

Figure 9.1:

(a) Slope of CD

(b) Equation of AB

Chapter 10

3D-Geometry

10.1. 2022

10.1.1. 10

1. The volume of a conical tent is $462m^3$ and the area of the base is $154m^2$. The height of the cone is:

   (a) $15m$

   (b) $12m$

   (c) $9m$

   (d) $24m$

2. The radius of a roller $100cm$ long is $14cm$. The curved surface area of the roller is: $(Take\pi = \frac{22}{7})$

   (a) $13200cm^2$

   (b) $15400cm^2$

   (c) $4400cm^2$

(d) $8800cm^2$

3. A solid cone of radius $5cm$ and height $9cm$ is melted and made into small cyliders of radius of $0.5cm$ and height $1.5cm$. Find the number of cylinders so formed.

4. A solid wooden cylinder is of radius $6cm$ and height $16cm$. Two cones ech of radius $2cm$ and height $6cm$ are drilled out of the cylinder. Find the volume of the remainiing solid.

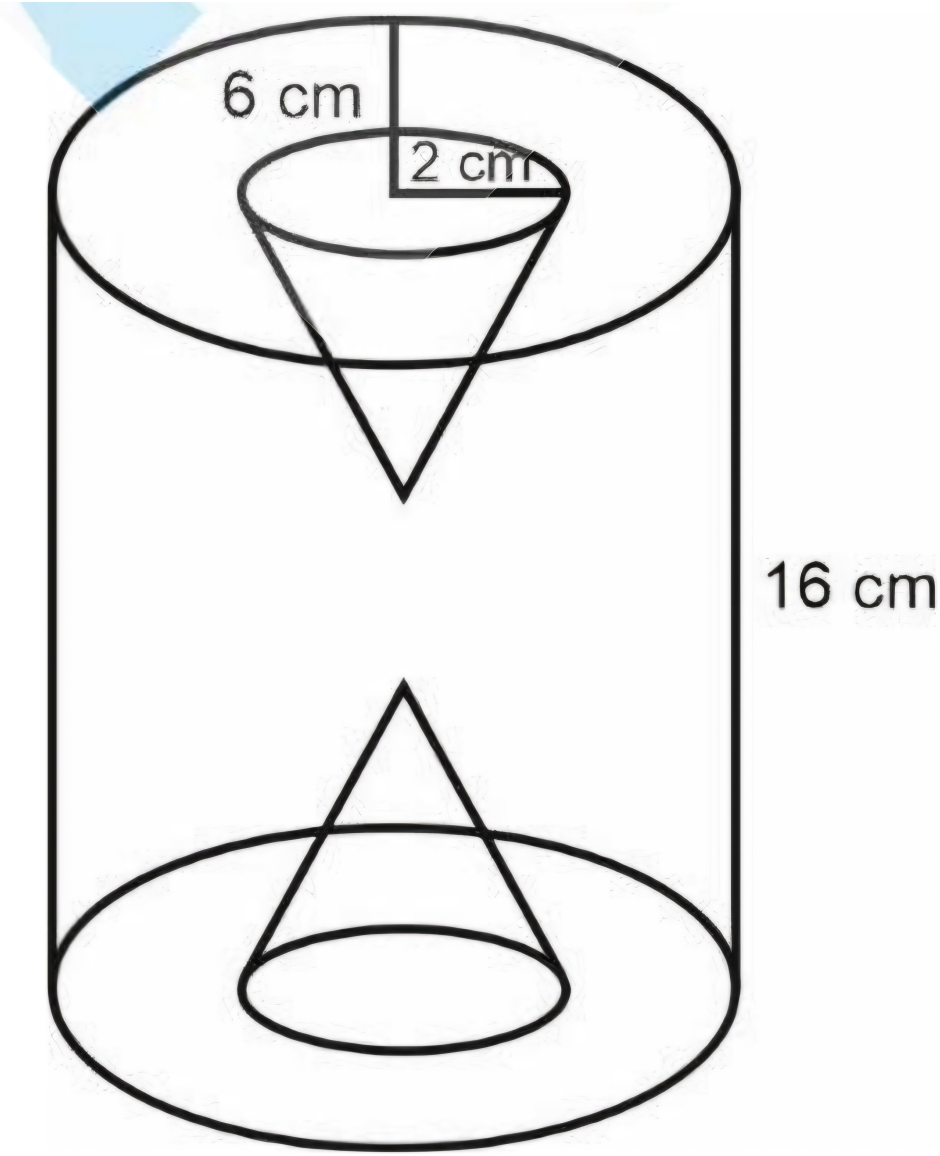

Figure 10.1:

Chapter 11

Discrete

Chapter 12

Number Systems

Chapter 13

Differentiation

Chapter 14

Integration

Chapter 15

Functions

Chapter 16

Matrices

Chapter 17

Data-Handling

17.1. 2022

17.1.1. 10

1. The median class for the given distribution is:

Class Interval	Frequency
0-10	2
10-20	4
20-30	3
30-40	5

   (a) $0 - 10$

   (b) $10 - 20$

   (c) $20 - 30$

   (d) $30 - 40$

2. The modal class of a given distribution always corresponds to the:

   (a) interval with highest frequency

(b) interval with lowest frequency

(c) the first interval

(d) the last interval

3. Calculate the mean of the following frequency distribution.

Class Interval	Frequency
5-15	2
15-25	6
25-35	4
35-45	8
45-55	4

4. Marks obtained by 100 students in an examination are given below.

Marks	No. of students
0-10	5
10-20	15
20-30	20
30-40	28
40-50	20
50-60	12

Draw a histogram for the given data using a graph paper and find the mode. Take $2cm = 10$ marks along one axis and $2cm = 10$ students along the other axis.

5. The mean of the following distribution is 50. Find the unknown

frequency.

Class Interval	Frequency
0-20	6
20-40	f
40-60	8
60-80	12
80-100	8

6. Marks obtained by 40 students in an examination are given below.

Marks	No. of students
10-20	3
20-30	8
30-40	14
40-50	9
50-60	4
60-70	2

Using graph paper draw an ogive and estimate the median marks.

Take $2cm = 10$ marks along one axis and $2cm = 5$ students along the other axis.

Chapter 18

Trignometry

18.1. 2022

18.1.1. 10

1. Prove that:

   $\frac{1}{1+\sin\theta} + \frac{1}{1-\sin\theta} = 2\sec^2\theta$

2. Prove that:

   $\frac{(1+\sin\theta)^2+(1-\sin\theta)^2}{2\cos^2\theta} = \sec^2\theta + \tan^2\theta$

3. Prove that:

   $1 + \frac{\tan^2\theta}{1+\sec\theta} = \sec\theta$