

SECTION-A

Section-A has 20 questions, carrying 1 mark each.

1. A cylinder, a cone and a hemisphere have same base and same height. The ratio of their volumes is :

- (a) 1:2:3
(b) 2:1:3
(c) 3:1:2
(d) 3:2:1

$$\pi r^2 h + \frac{1}{3} \pi r^2 h + \frac{2}{3} \pi r^3$$
$$\pi r^2 \left(h + \frac{1}{3} h + \frac{2}{3} r \right)$$
$$\pi r^2 \left(h + \frac{1}{3} h + \frac{2}{3} r \right)$$

2. If sum of 10th term and 18th term of an A.P. is 128, then the 14th term of an A.P. is: 1

- (a) 64
(b) 48
(c) 82
(d) 74

$$a + a_d + a + 17d = 128$$
$$2a + 2d = 128$$
$$2(a + d) = 128$$
$$a + d = 64$$
$$2(a + 13d) = 128$$

3. The HCF of smallest two digit even number and greatest one digit even number is : 1

- (a) 2
(b) 4
(c) 8
(d) 80

$$10 : - 5 \times 2$$
$$2 \times 2$$

$$\frac{10}{2} = 5$$
$$\frac{2}{2} = 1$$

4. If the perimeter of a sector of a circle of radius 8cm is 43cm, then the area of the sector is:

- (a) 172 cm²
(b) 86 cm²
(c) 344 cm²
(d) 473 cm²

$$\frac{\theta}{360} \times 2\pi r = 43$$
$$\frac{\theta}{360} \times 2 \times \pi \times 8 = 43$$
$$\frac{\theta}{360} \times 16\pi = 43$$

5. If the coordinates of both ends of the diameter of a circle with centre (4, 5) are (3, y) and (x, 8) then the value of x - y is :

- (a) 1
(b) 2

- (c) 3
(d) 4

$$2\pi r \times \frac{\theta}{360} = 43$$
$$43 \times 360 = 2\pi r \times \theta$$

$$\frac{22}{7} \times 16 \times 360 = 43 \times \theta$$



6. Neha has 160cm long stick and Nikhil has 280cm long stick. They both cut the sticks into pieces such that all pieces are of equal length. What is the maximum length of each piece?

(a) 20 cm

(b) 40 cm

(c) 80 cm

(d) 56 cm

$$\begin{array}{r} 2 \overline{) 160} \\ \underline{2 } \\ 2 \\ \underline{2 } \\ 2 \\ \underline{2 } \\ 0 \\ 8 \\ \underline{8 } \\ 0 \\ 1 \end{array} \quad \begin{array}{r} 2 \overline{) 280} \\ \underline{2 } \\ 2 \\ \underline{2 } \\ 2 \\ \underline{2 } \\ 0 \\ 5 \\ \underline{5 } \\ 7 \\ \underline{7 } \\ 0 \\ 1 \end{array}$$

7. The equation of a line parallel to $4x - 2y = 8$ is :

(a) $7x + 3y = 9$

(b) $8x - 4y = 16$

(c) $8x - 4y = 7$

(d) $4x + 3y = 9$

$8 \times 8 = 40$
 $6 \sqrt{64} = 3$

8. The perimeter of a triangle with vertices $(0, 0)$, $(6, 0)$ and $(0, 8)$ is :

(a) 14 units

(b) 24 units

(c) 12 units

(d) 22 units

$$\sqrt{(0+0)^2 + 0^2} = 0$$

$$\sqrt{36+64} = 10$$

$$\sqrt{6^2 + 8^2} = 10$$

9. If the n^{th} term of an A.P. is given by $a_n = 3n + 2$, then common difference of the A.P. is :

(a) 5

(b) -5

(c) 7

(d) 3

$$a_n = 3n + 2$$

$$a_1 = 3(1) + 2 = 5$$

$$a_2 = 3(2) + 2 = 8$$

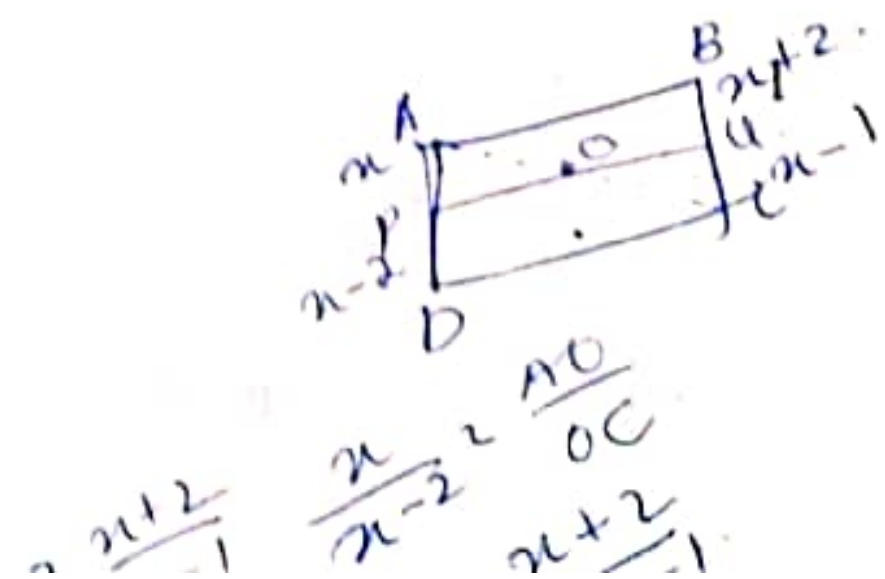
10. In a quadrilateral ABCD, if $AB \parallel DC$ and $PQ \parallel AB$, such that $AP = x$, $PD = x - 2$, $BQ = x + 2$, $CQ = x - 1$, then the value of x is :

(a) 4

(b) 2

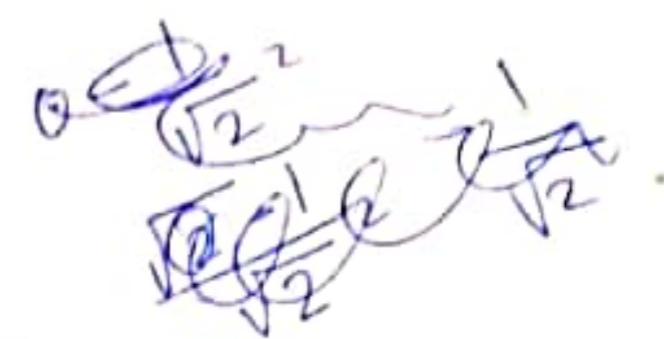
(c) 1

(d) 5



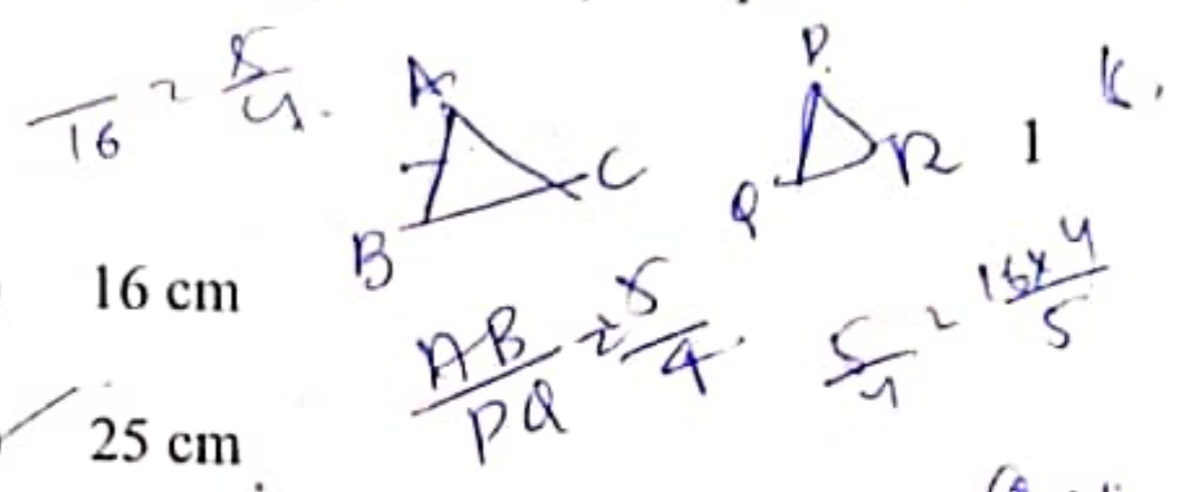
11. If $\sin x = \frac{1}{\sqrt{2}}$ and $\cos y = 0$, then the value of $y - x$ is: $90^\circ - 45^\circ = 45^\circ$ 1

- (a) 15° (b) 30°
 ✓ (c) 45° (d) 60°



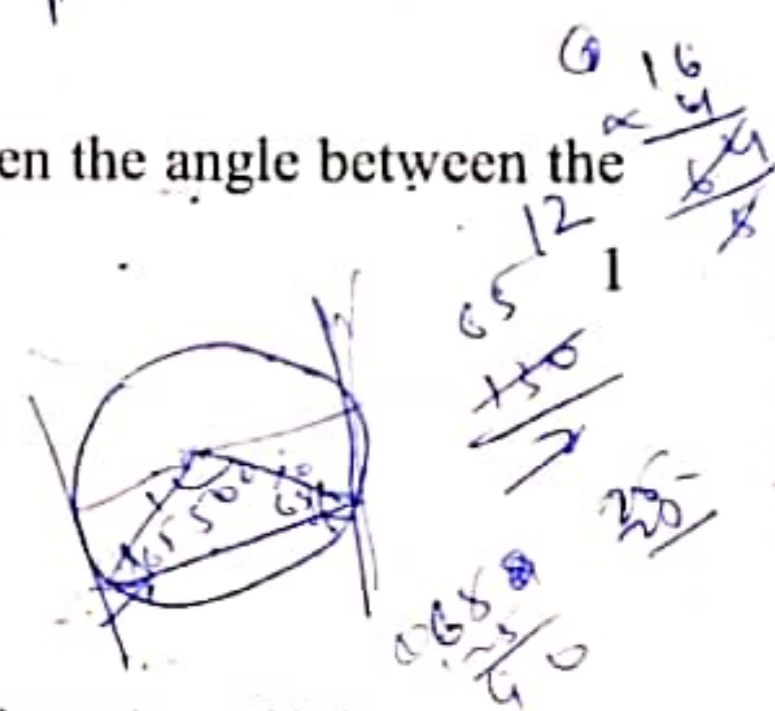
12. If in triangles $ABC \sim PQR$, $\frac{AB}{PQ} = \frac{5}{4}$ and perimeter of $\Delta PQR = 16$ cm, then perimeter of ΔABC is:

- (a) 8 cm (b) 16 cm
 (c) 20 cm ✓ (d) 25 cm



13. If a chord subtends an angle of 50° at the centre of the circle, then the angle between the tangents drawn at the end points of the chord is:

- (a) 100° ✓ (b) 130°
 (c) 75° (d) 90°



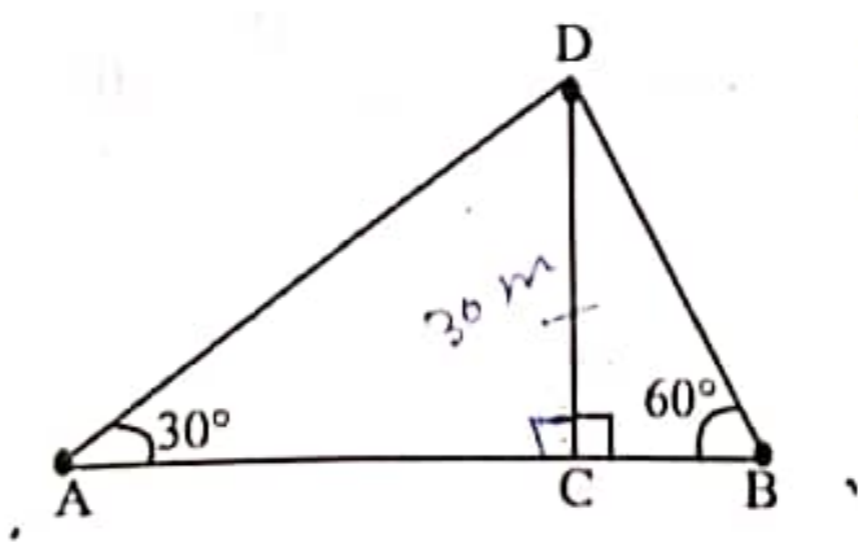
14. If one zero of the quadratic polynomial $x^2 + kx + 4k$ is 4, then the value of k is: 1

- (a) 1 ✓ (b) -2
 (c) 4 (d) 0

$(4)^2 + k(4) + 4k = 0$
 $16 + 4k + 4k = 0$
 $16 + 8k = 0$

15. In the fig., if $CD = 30$ m, then the length of AB is:

$\frac{DC}{AC} = \frac{1}{\sqrt{3}}$
 $30\sqrt{3} = AC$



$\frac{30}{CB} = \frac{1}{\sqrt{3}}$
 $CB = \frac{30\sqrt{3}}{3}$
 $AB = AC + CB = 30\sqrt{3} + 30\sqrt{3} = 60\sqrt{3}$

- (a) 60 m (b) $30\sqrt{3}$ m
 ✓ (c) $40\sqrt{3}$ m (d) $30(\sqrt{3} + 1)$ m

16. If one root of the quadratic equation $x^2 + ax + 6 = 0$ is 1, then its other root is: 1

(a) 5

(b) -5

(c) 6

(d) 7

$(1)^2 + a(1) + 6 = 0$
 $1 + a + 6 = 0$
 $a + 7 = 0$
 $a = -7$

$x^2 - 7x + 6 = 0$

17. The difference of upper limit of modal class and lower limit of median class for the following data is:

$x^2 - 6x + 1x + 6 = 0$
 $x^2 + 1x - 6x + 6 = 0$
 $x(x+1) - 6(x-1) = 0$
 $(x-5)(x+6) = 0$
 $x = 5$

Marks	0-10	10-20	20-30	30-40	40-50
Number of students	2	5	17	10	16

2 7 24 34 50

(a) 0

(b) 20

(c) 30

(d) 10

$\frac{50-25}{2}$

18. In a box, there are number cards 1 to 100. A card is drawn at random. The probability of getting either a perfect square number or a perfect cube on the card is: 1

(a) 1

(b) $\frac{1}{10}$

(c) $\frac{7}{50}$

(d) $\frac{13}{100}$

1
2
3

10 - 2 - 1

Directions for Question No. 19-20 :

In question numbers 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option :

- (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 and 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 HCF of 28, 49 and 91 is 7.

Reason (R): HCF of two or more numbers is the product of least power of common prime factor of the numbers.

20. **Assertion (A):** Class mark is the mid point of the class interval.

Reason (R): Class mark = $\frac{\text{upper limit} + \text{lower limit}}{2}$

Handwritten calculations for HCF of 28, 49, and 91:

28: $2 \times 2 \times 7$
49: 7×7
91: 7×13

HCF = 7

SECTION-B

Section-B consists of 5 questions of 2 marks each.

21. If $\sin A + \cos A = \sqrt{2}$, then find the value of $\tan A + \cot A$.

2

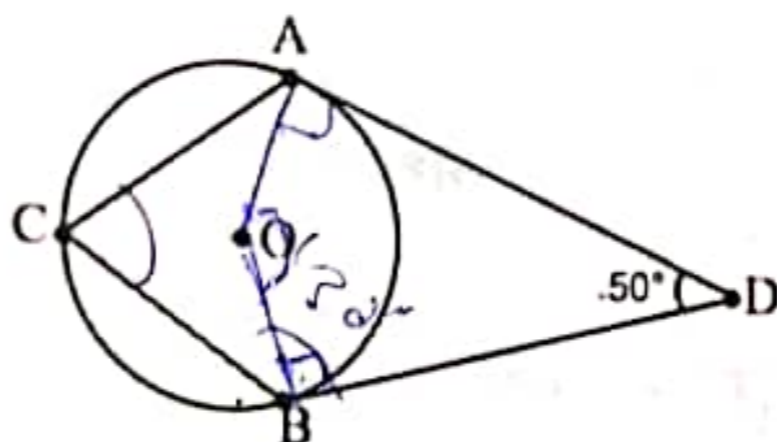
Evaluate: $\frac{\cos 30^\circ + \sin 60^\circ}{\cos 60^\circ + \sin 30^\circ}$

OR

$\frac{\frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2}}{\frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2}} = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} + \sqrt{2}} = 1$

22. In the figure, O is the centre of the circle. DA and DB are the tangents to the circle from D. If $\angle ADB = 50^\circ$, then find $\angle ACB$.

2



23. Find the area swept by the minute hand of a clock of radius 14cm in 25 minutes.

2

24. The volume of a cylinder is 1386 cm^3 and the curved surface area is 396 cm^2 , then find the height of the cylinder.

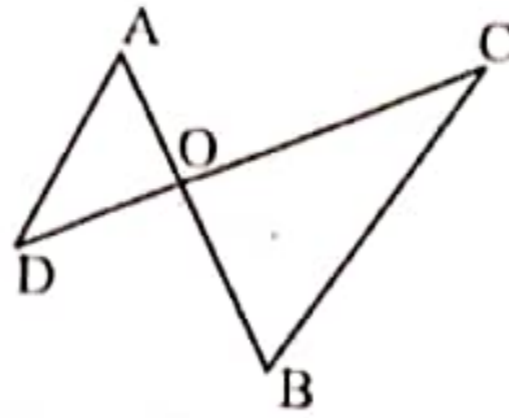
2

OR

A right circular cone of radius 7cm has a curved surface area of 550 cm^2 . Find the volume of the cone.



25. In the given figure, $OA \times OB = OC \times OD$. Prove that $\angle A = \angle C$ and $\angle B = \angle D$. 2



SECTION-C

Section-C consists of 6 questions of 3 marks each.

26. Prove that $2\sqrt{5} - 3$ is an irrational number. 3

27. Find the middle term of the A.P. 202, 196, 190,..... 22. 3

OR

Find the sum of all three digit numbers divisible by 3.

28. If $m = a \cos \theta + b \sin \theta$ and $n = a \sin \theta - b \cos \theta$, then prove that 3

$$m^2 + n^2 = a^2 + b^2$$

29. From a well shuffled pack of cards, a card is drawn at random, then find the probability of getting a : 3

- (i) Red face card
- (ii) Black card
- (iii) Black face card when all the kings and queens have been removed from the pack.

Handwritten calculations for question 27:

$$3 \overline{) 107} \\ \underline{64} \\ 43$$

$$3 \overline{) 105} \\ \underline{61} \\ 44$$

$$3 \overline{) 108} \\ \underline{62} \\ 46$$

$$3 \overline{) 105} \\ \underline{61} \\ 44$$

$$3 \overline{) 108} \\ \underline{62} \\ 46$$

$$3 \overline{) 105} \\ \underline{61} \\ 44$$

$$3 \overline{) 108} \\ \underline{62} \\ 46$$

30. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre. 3

OR

In a circle with centre O, AB is a diameter, AC is a chord and AP is a tangent at A. Prove that angle $\angle CAP = \angle ABC$.

31. If α and β are the zeroes of $2x^2 + 7x + 5$, then find a quadratic polynomial whose zeroes are 2α and 2β . 3

SECTION-D

Section-D consists of 4 questions of 5 marks each.

32. Prove Basic Proportionality theorem. With the help of it, prove that the intercepts made by three parallel lines when they are intersected by two transversals are proportional. 5
33. The angle of depression of the top and bottom of a 300m high building from the top of a tower are 30° and 60° respectively. Find the height of tower and distance between them. 5

OR

A man is standing on the deck of the ship which is 20 m above sea level. He observes the angle of elevation of the top of a transmission tower as 60° and the angle of depression of the foot of the tower as 30° . Calculate the height of the tower and the distance of the ship from the tower.

34. A survey was conducted in a society and data of expenditure per week by the children of the society had been recorded as below. Find the modal expenditure and median expenditure of a week of children of the society.

Expenditure (in ₹) per week	0-50	50-100	100-150	150-200	200-250	250-300	300-350	350-400
Number of children	12	7	6	11	14	22	17	11

35. In a class test, the sum of Anaya's marks in mathematics and science is 40. If she had scored 6 marks more in mathematics and 1 mark less in science, the product of marks would have been 450. Find her marks in two subjects. 5

OR

Solve for x : $9x^2 - 9(a + b)x + (2a^2 + 5ab + 2b^2) = 0$

SECTION-E

$y + x = 40$
 $y = 40 - x$

Section-E consists of 3 based questions of 4 marks each.

36. Ice cream stall is one of the most favourite stalls of children in any function. Children love to taste ice cream. In a function ice cream is served in vessels of different shapes. The conical vessel is of height 5cm and radius 3.5cm, whereas a cylindrical vessel has radius 4.2cm and height 4cm.

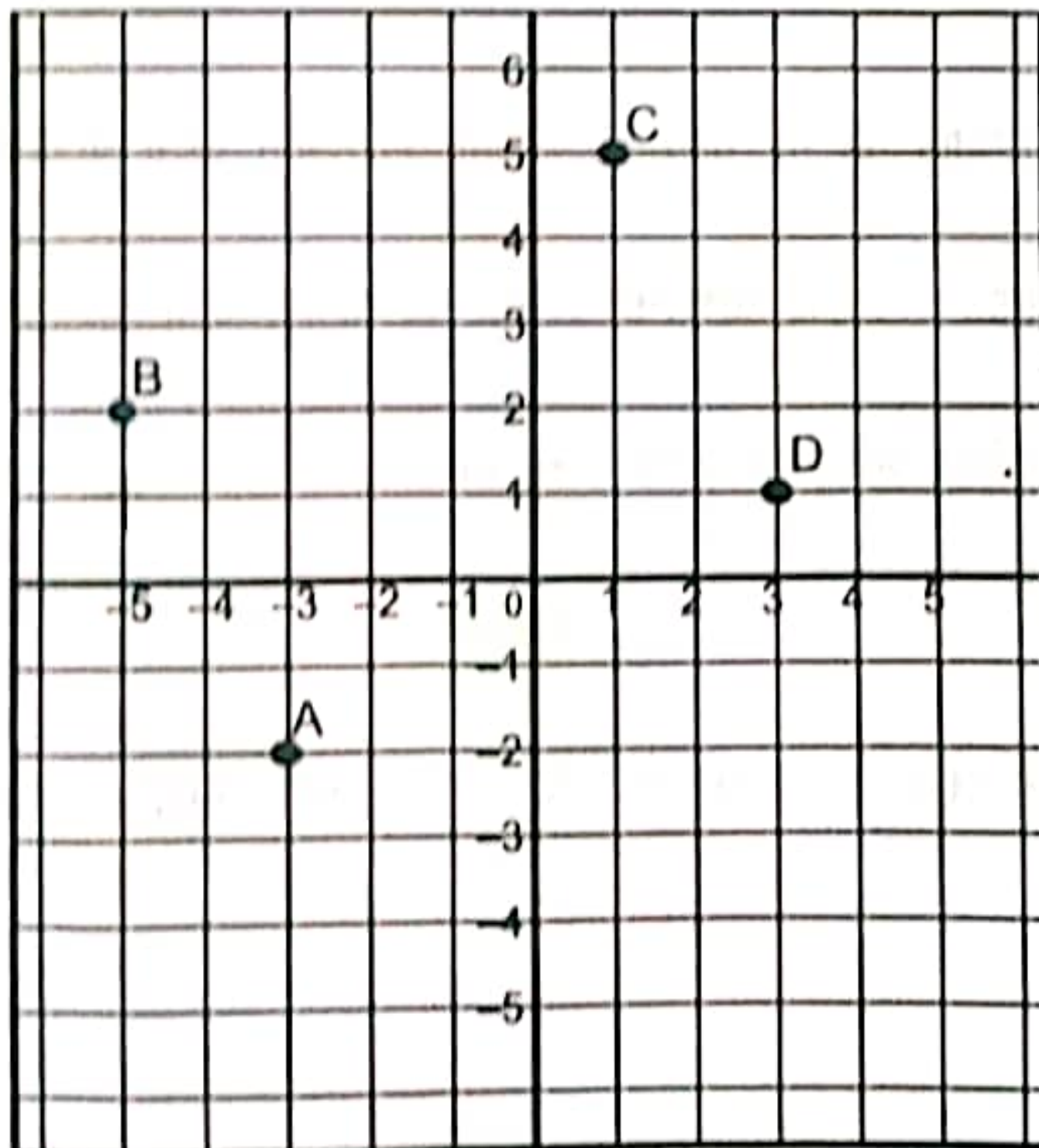
Based on the above information, answer the following questions:

- (i) Find the volume of the conical vessel, 1
- (ii) Find the volume of the cylindrical vessel, 1
- (iii) If Rohan has also got a hemispherical scoop of ice cream on the cone, than how much ice cream did he get in all? 2

OR

Gaurish put 2 spherical chocolates of radius 0.7cm in the cylindrical container, then find how much ice cream can be poured in the container?

37. A school went on a picnic in a city. After returning from picnic Sumit thought to plot the places visited on a graph sheet and shown the graph (as shown below) to his friends on next day.



Based on the above information, answer the following questions:

- (i) Find the distance they had to travel to reach point B from point A. 1
- (ii) Find the coordinates of point E lying on BC which divides it in the ratio 1:2. 1
- (iii) Name the quadrilateral so formed by joining these points in an order. 2

OR

Find the distance travelled on the day of picnic?

38. Libraries play a vital role in providing people books to read from and enhance their knowledge. Saraswati library in a society takes a fixed charge for first three days and an additional charge for each day thereafter. Shobha paid ₹ 30 for a book kept for 7 days while Rani paid ₹ 45 for a book kept for 10 days.

Based on above information answer the following questions:

- (i) Algebraic equation representing situation of amount paid by Shobha. 1
- (ii) Algebraic equation representing situation of amount paid by Rani. 1
- (iii) Find the fixed charge and additional charge. 2

OR

How much money you have to pay for a book kept for 15 days?