

General Instructions:

- All questions are compulsory. In addition to this, separate instructions are given with each section and question, wherever necessary.
- SECTION – A: **Objective Type Questions** – Q1 to Q20 of **1 mark each**. [Q19 and Q20 are based on Assertion and Reasoning.]
- SECTION – B: **Very Short Answer Type Questions** – Q21 to Q25 of **2 marks each**.
- SECTION – C: **Short Answer Type Questions** – Q26 to Q31 of **3 marks each**.
- SECTION – D: **Long Answer Type Questions** – Q32 to Q35 of **5 marks**.
- SECTION – E: **CASE STUDY** – Q36 to Q38 of **4 marks**.

SECTION-A**(20 X 1 = 20)***Choose the correct option:*Q1. The value of $(125)^{\frac{1}{3}}$ is -----

- a) 5 b) 25 c) 45 d) 35

Q2. The rationalising factor of $7 - 2\sqrt{3}$ is ___

- (a) $7 + 2\sqrt{3}$ (b) $7 - 2\sqrt{3}$ (c) $14 + 2\sqrt{3}$ (d) $5 + 2\sqrt{3}$

Q3. If $x = \frac{\sqrt{2}}{5}$ and $\frac{5}{x} = p\sqrt{2}$, then the value of p is

- (a) $\frac{5}{\sqrt{2}}$ (b) $\frac{25}{2}$ (c) $\frac{7}{25}$ (d) None

Q4. The figure obtained by plotting the points in order; A(2,3), B(-2,3), C(-2,-3) and D(2,-3) is

- a) _____
 (a) Trapezium (b) Rectangle (c) Square (d) Rhombus

Q5. The graph of the linear equation $y = x$ passes through the point ___

- (a) $(\frac{3}{2}, -\frac{3}{2})$ (b) $(0, \frac{3}{2})$ (c) (1,1) (d) $(-\frac{1}{2}, \frac{1}{2})$

Q6. The coefficient of the variable y in the linear equation $5(2x - y) + 3x + 4y - 7 = 0$ is ___

- (a) 13 (b) -9 (c) -1 (d) 9

Q7. If $(2p - 1, p)$ is a solution of the equation $10x - 9y = 12$, then the value of p is ___

- (a) 1 (b) 4 (c) 2 (d) 3

Q8. All factors of $x^2 - 3x$ are are :

- (a) 3 (b) 0 (c) 0,3 (d) 0, -3

$$a^2 + 2ab + b^2 = (a+b)^2$$

Q9. Without actual calculation find the value of $18 \times 18 + 2 \times 18 \times 82 + 82 \times 82$

- (a) 3276 (b) 3358 (c) 9694 (d) 10000

Q10. If $p(x) = x^2 - 4x + 3$, then the value of $p(-2)$ is

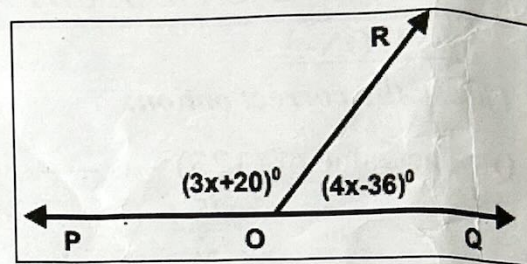
- (a) 1 (b) -1 (c) 15 (d) -7

Q11. If the area of a rectangle is $4x^2 + 4x - 3$, then its possible dimensions are

- (a) $(2x - 3), (2x + 1)$ (b) $(2x - 1), (2x + 3)$
- (c) $(3x + 1), (2x - 3)$ (d) $(3x - 1), (2x + 3)$

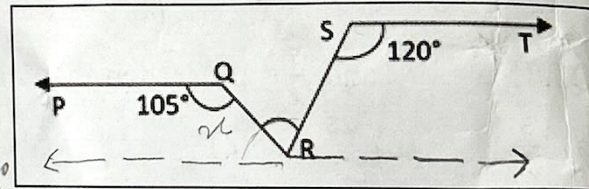
Q12. In the adjoining figure the value of x is

- (a) 25° (b) 28° (c) 30° (d) 60°



Q13. In the given figure, if $PQ \parallel ST$, $\angle PQR = 105^\circ$ and $\angle RST = 120^\circ$, find $\angle QRS$

- (a) 30° (b) 45° (c) 60° (d) 75°



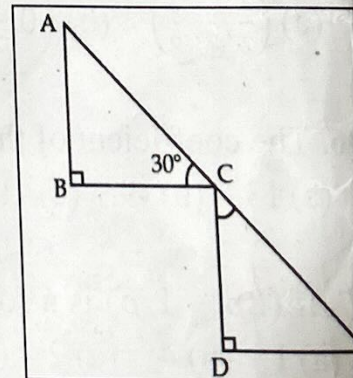
$40^\circ, 50^\circ, 90^\circ$

Q14. The angles of a triangle are in the ratio 4 : 5 : 9. The triangle is

- (a) an isosceles triangle (b) an obtuse angled triangle
- (c) an acute angled triangle (d) a right triangle

Q15. If in a triangle ABC, $\angle A + \angle B = 105^\circ$, $\angle B + \angle C = 120^\circ$ then $\angle B$ is:

- (a) 65° (b) 80° (c) 35° (d) 45°



Q16. In the given fig. $BC \parallel DE$. If $\angle ABC = \angle CDE = 90^\circ$ and $\angle ACB = 30^\circ$ then the measure of $\angle DCE$ is:

(a) 30°

(b) 60°

(c) 90°

(d) 120°

Q17. Euclid stated that if equals are subtracted from equals, the remainders are equals in the form of

(a) an axiom

(b) a postulate

(c) a definition

(d) a proof

Q18. In $\triangle ABC$, if $AB=AC$ and $\angle B = 70^\circ$, then the measure of $\angle A$ is ___

(a) 70°

(b) 40°

(c) 110°

(d) 35°

Q19. Assertion : Rational number lying between two rational numbers a and b is $(a+b)/2$.

Reason : There is one rational number lying between any two rational numbers.

(a) Both assertion and reason are true and reason is the correct explanation of assertion.

(b) Both assertion and reason are true and reason is not the correct explanation of assertion.

(c) Assertion is true but reason is false.

(d) Assertion is false but reason is true.

Q20. Assertion: If $AB=DE$ and $DE=LM$ then $AB=LM$.

Reasoning: Things which are equal to the same thing are also equal to one another.

(a) Both assertion and reason are true and reason is the correct explanation of assertion.

(b) Both assertion and reason are true and reason is not the correct explanation of assertion.

(c) Assertion is true but reason is false.

(d) Assertion is false but reason is true.

SECTION-B

(5 X 2 = 10)

Q21. Express $1.\overline{32} + 0.\overline{35}$ as a fraction in the simplest form.

Q22. Find the value of k , for which the polynomial $x^3 - 3x^2 + 3x + k$ has 3 as its zero. $k = -9$

OR

Find the value of following expression using identity: $\frac{(361)^3 + (139)^3}{(361)^2 - 361 \times 139 + (139)^2}$

Q23. In which quadrant or which axis do each of the points $(-1,0)$, $(3,-1)$, $(0,4)$ and $(-2,-3)$ lie?

Q24. State Euclid's fifth postulate with the help of figure.

Q25. Prove that the angles opposite to equal sides of an isosceles triangle are equal.

SECTION-C

(6 X 3 = 18)

Q26. If $\frac{3}{\sqrt{3}+1} + \frac{5}{\sqrt{3}-1} = a + b\sqrt{3}$, find a and b . $a=1$ $b=4$

$$(x+1)(x+1)(x-5)$$

Q27. Factorise $p(x) = x^3 - 3x^2 - 9x - 5$ by using factor theorem.

Factorise:

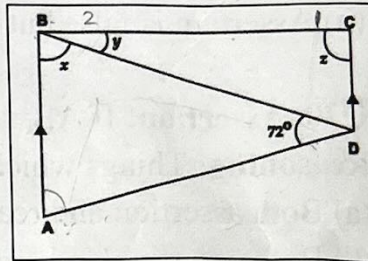
OR

(i) $x^2 - 1 - 2a - a^2$ (ii) $x^2 + \frac{1}{x^2} + 2 - 2x - \frac{2}{x}$

Q28. Find four different solutions of the equation $x + 2y = 6$. Also, express y in terms of x

Q29. The taxi fare in a city is as follows: For the first kilometre, the fare is Rs. 8 and for the subsequent distance it is Rs. 5 per km. Taking the distance covered as x km and total fare as Rs y , write a linear equation for this information and find 2 solutions for the same.

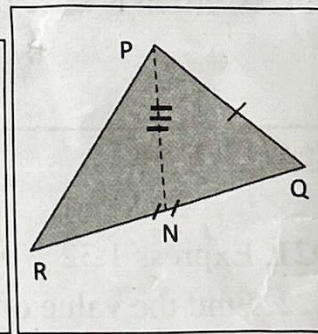
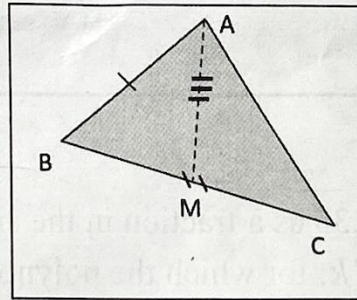
Q30. In the figure, $AB \parallel DC$ and $\angle BDA = 72^\circ$. If $\frac{4}{3}x = y$, $\frac{3}{4}y = z$, find the measures of $\angle BCD$, $\angle ABC$ and $\angle BAD$.



Q31. Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of triangle PQR.

Show that:

- (i) $\triangle ABM \cong \triangle PQN$
- (ii) $\triangle ABC \cong \triangle PQR$



SECTION-D

(4 X 5 = 20)

Q32. (a) If $x = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ and $y = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$, find the value of $x^2 + y^2$

3 marks

$$x^2 + y^2 = 98$$

(b) If $4^{2x-1} \times 16^{x-1} = 1024$, then find the value of x

2 marks

$$x = 2$$

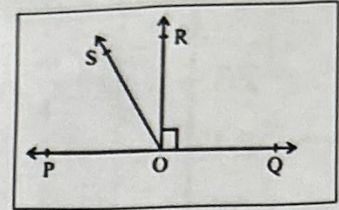
Q33. R_1 and R_2 are the remainders when the polynomials $x^3 + 2x^2 - 5ax - 7$ and $x^3 + ax^2 - 12x + 6$ are divided by $(x + 1)$ and $(x - 2)$ respectively. If $2R_1 + R_2 = 6$, find the value of a .

a. $a = 2$

OR

The polynomial $f(x) = x^4 - 2x^3 + 3x^2 - ax + b$ when divided by $(x - 1)$ and $(x + 1)$ leaves the remainders 5 and 19 respectively. Find the values of a and b . Hence, find the remainder when $f(x)$ is divided by $(x - 3)$.

Q34. In the given figure, POQ is a line. Ray OR is perpendicular to line PQ . OS is another ray lying between rays OP and OR . Prove that $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$.



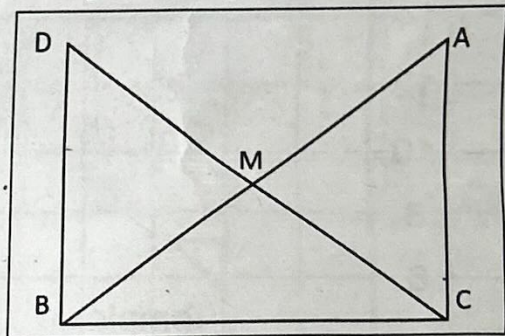
OR

Prove that if a transversal intersects two lines such that the bisectors of a pair of corresponding angles are parallel, then prove that the two lines are parallel.

Q35. In right triangle ABC , right angled at C , M is the mid-point of hypotenuse AB . C is joined to M and produced to a point D such that $DM = CM$. Point D is joined to point B .

Show that:

- (i) $\triangle AMC \cong \triangle BMD$
- (ii) $\angle DBC$ is a right angle.
- (iii) $\triangle DBC \cong \triangle ACB$
- (iv) $CM = \frac{1}{2} AB$



SECTION-E

(3 X 4 = 12)

Q36. (CASE STUDY 1) Read the following and answer the questions given below:

Look at the maps in Picture I and Picture II showing some places of an area of a city.

In Picture I, the map is put on coordinate axes by fixing the church (C) as the origin.

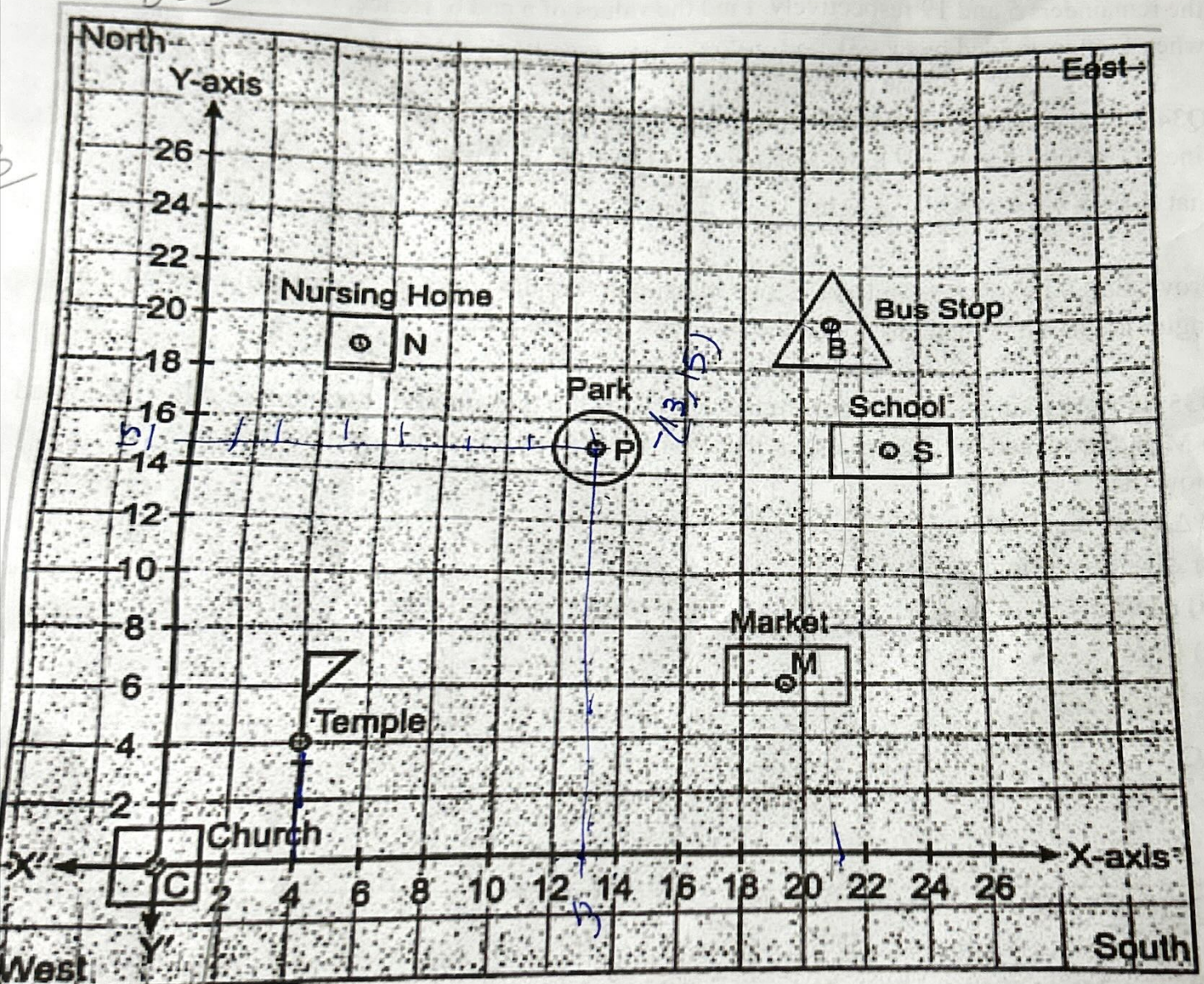
In Picture II, the map is put on coordinate axes by fixing the Bus Stop (B) as the origin.

Refer the pictures and the key to answer the following questions:

KEY: N= Nursing Room, P=Park, B= Bus Stop, S=School, T= Temple, M= Market, C=Church

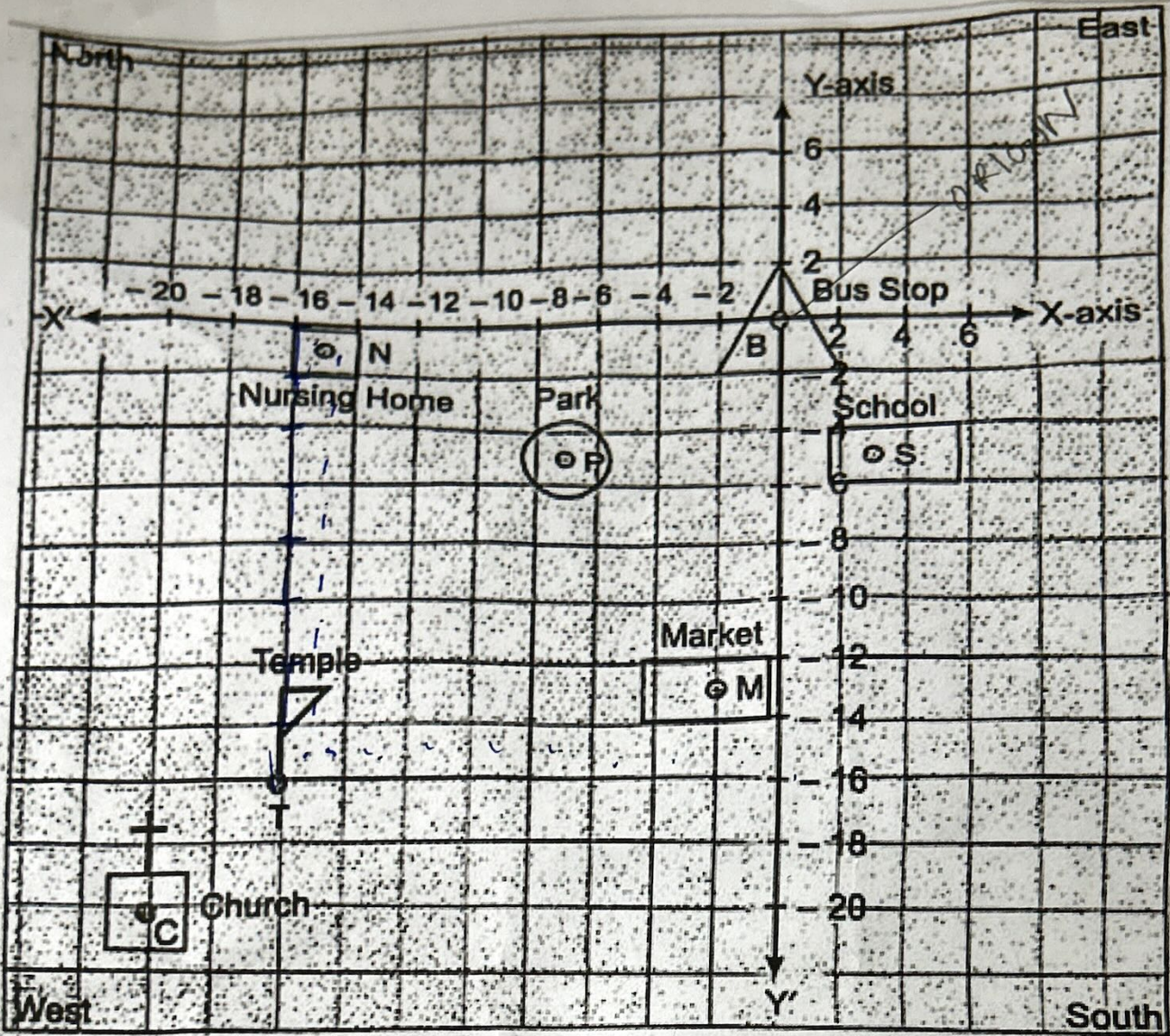
- (i) What are the coordinates of Bus Stop (B) in Picture I? (21, 20) 1 mark
- (ii) What is the perpendicular distance of Temple (T) from x-axis in Picture II? 8 1 mark
- (iii) In Picture I, the position of the Park is represented by the point $[3a - 2, \frac{7}{5}b + 8]$, then what are the values of a and b ? 2 marks

$a = 5$
 $b = 5$



Picture I

origin

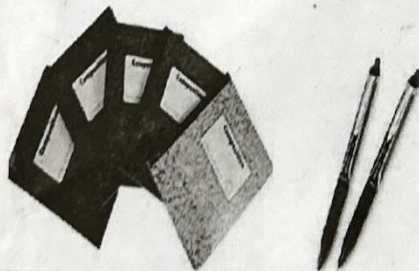


Picture II

Q37. (CASE STUDY 2)

Case Study - 2

Sanjay bought 5 notebooks and 2 pens for ₹120. He told to guess the cost of each notebook and pen to his friends Mohan and Anil. Sanjay has given the clue that both the costs are positive integers and divisible by 5 such that the cost of a notebook is greater than that of a pen.



Now, Mohan and Anil tried to guess. Mohan said that price of each notebook could be ₹18. Then five notebooks would cost Rs. ₹90, the two pens would cost ₹30 and each pen could be for ₹15. Anil felt that ₹18 for one notebook was too little. It should be at least ₹20. Then the price of each pen would also be ₹10.

Based on the above information answer the following questions:

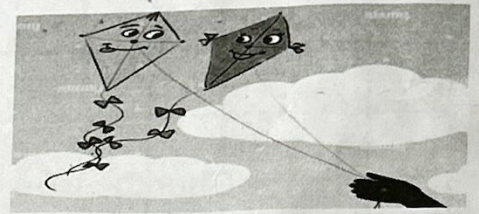
I	Form the linear equation in two variables from this situation by taking cost of one notebook as ₹ x and cost of one pen as ₹ y . $5x + 2y = 120$	1
II	If the cost of one notebook is ₹ 15 and cost of one pen is ₹10, then find the total amount. ₹95	1
III	If the cost of 1 notebook is twice the cost of 1 pen, then find the cost of 1 pen ?	2

$x = 2y$ in $5x + 2y = 120$

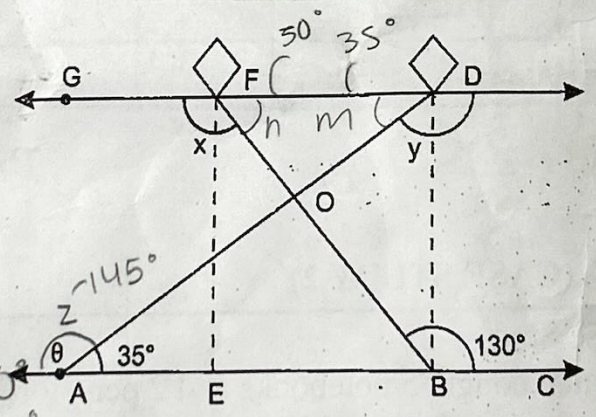
Q38. (CASE STUDY 3)

Read the following and answer the questions given below:

Two friends A and B are flying kites in an open ground. At some instance, their kites are at the same height from



the ground crossing each other at a point. Refer the diagram showing the angles made by the strings of their kites with the ground level and the location of kites in the figure below to answer the questions that follow:



(i) What is the measure of angle x ? **1 mark** $x = 130$

(ii) What is the measure of angle y ? **1 mark** $y = 145$

(iii) Find the measure of $\angle BOD$ **2 marks**