

BUDHA DAL PUBLIC SCHOOL PATIALA  
FIRST TERM EXAMINATION (18 September, 2025)

Class - IX

Paper-Mathematics (Set-A)

Time: 3hrs.

M.M. 80

**General Instructions:**

1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.

**Section-A**

1. Every rational number is
  - a) An integer
  - b) A real number
  - c) A natural number
  - d) A whole number
2. Rationalising factor for the denominator of the expression  $\frac{1}{\sqrt{3}-\sqrt{5}}$  is
  - a)  $\sqrt{3} + \sqrt{5}$
  - b)  $\sqrt{5} - \sqrt{3}$
  - c)  $\frac{3}{\sqrt{3}-\sqrt{5}}$
  - d)  $\frac{5}{\sqrt{3}+\sqrt{5}}$
3. Coefficient of  $x^3$  in  $2 - x^3 + x^2 - x$ 
  - a) 1
  - b) -1
  - c) 0
  - d) 2
4. The value of  $p(x) = 6x^2 + 7 - 3$  when  $x = -1$ 
  - a) -4
  - b) 4
  - c) 10
  - d) 12
5. Zero of the polynomial  $p(a) = 3a + 2$ , is
  - a)  $\frac{2}{3}$
  - b)  $\frac{3}{2}$
  - c)  $-\frac{2}{3}$
  - d)  $-\frac{3}{2}$
6. What is the value  $k$ , if  $(x + 1)$  is a factor of  $(x) = kx^2 - x - 4$ ?
  - a) 0
  - b) 1
  - c) 2
  - d) 3
7. Any point on the line  $y = x$  is of the form
  - a)  $(a, a)$
  - b)  $(0, a)$
  - c)  $(a, 0)$
  - d)  $(a, -a)$
8. Equation represent  $x - axis$  is
  - a)  $y = 0$
  - b)  $x = 0$
  - c)  $x = y$
  - d)  $x = -y$
9. If  $(1, 2)$  is a solution of the linear equation  $3x + 2y = A$ , then value of  $A$  is
  - a) 8
  - b) -8
  - c) 7
  - d) -7

10. Degree of the quadratic polynomial is

a) 2    b) 3    c) 4    d) 1

11. If coordinates of two points  $P(-3, 5)$  and  $Q(3, 2)$  then (abscissa of  $P$  - Ordinate of  $Q$ )

a) -5    b) 5    c) 6    d) -6

12. Cubic polynomial has

a) 2 zeros    b) 3 zeros    c) 4 zeros    d) 1 zero

13. Sign of abscissa and ordinate in 3<sup>rd</sup> quadrant are

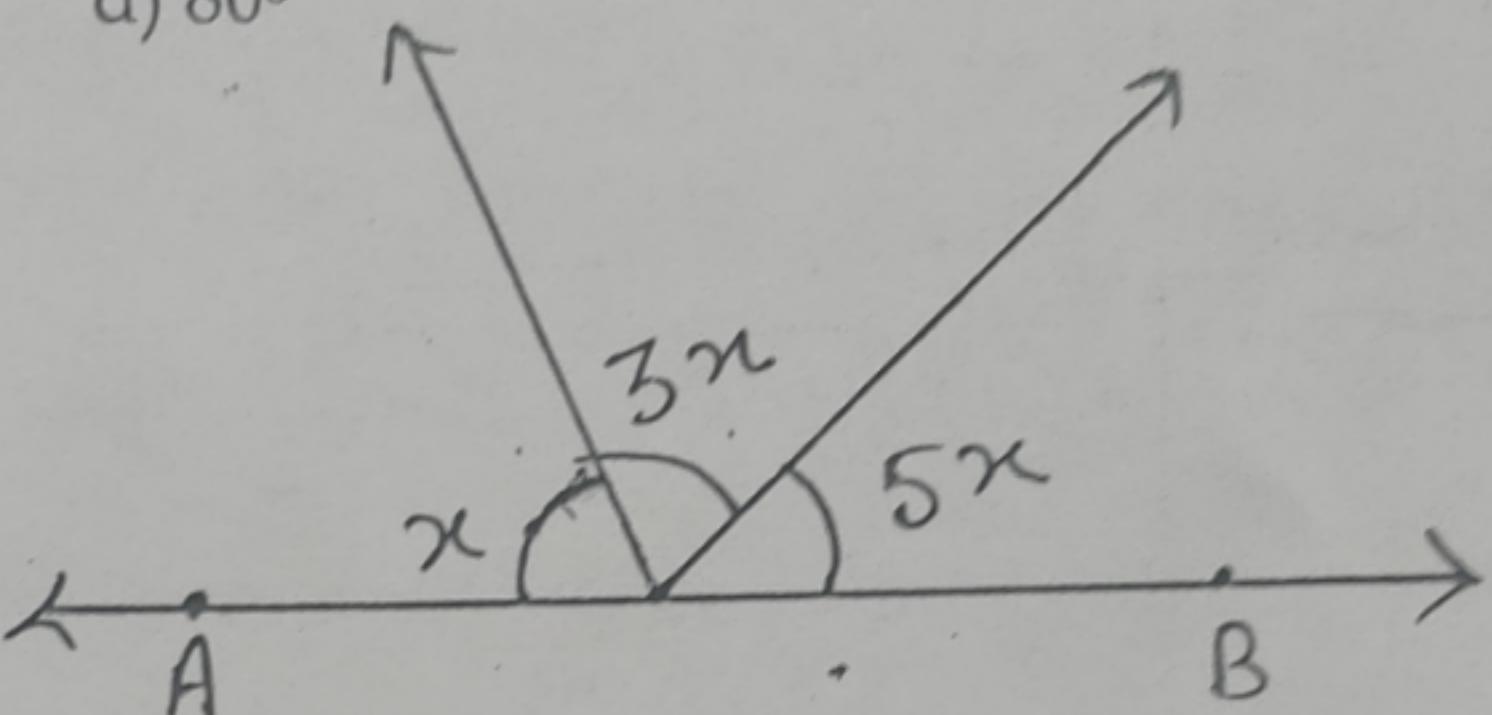
a) (+, +)    b) (-, -)    c) (-, +)    d) (+, -)

14. The angle which exceeds its complement by  $30^\circ$ .

a)  $120^\circ$     b)  $60^\circ$     c)  $150^\circ$     d)  $80^\circ$

15. Find  $x$

a)  $10^\circ$   
b)  $20^\circ$   
c)  $30^\circ$   
d)  $40^\circ$

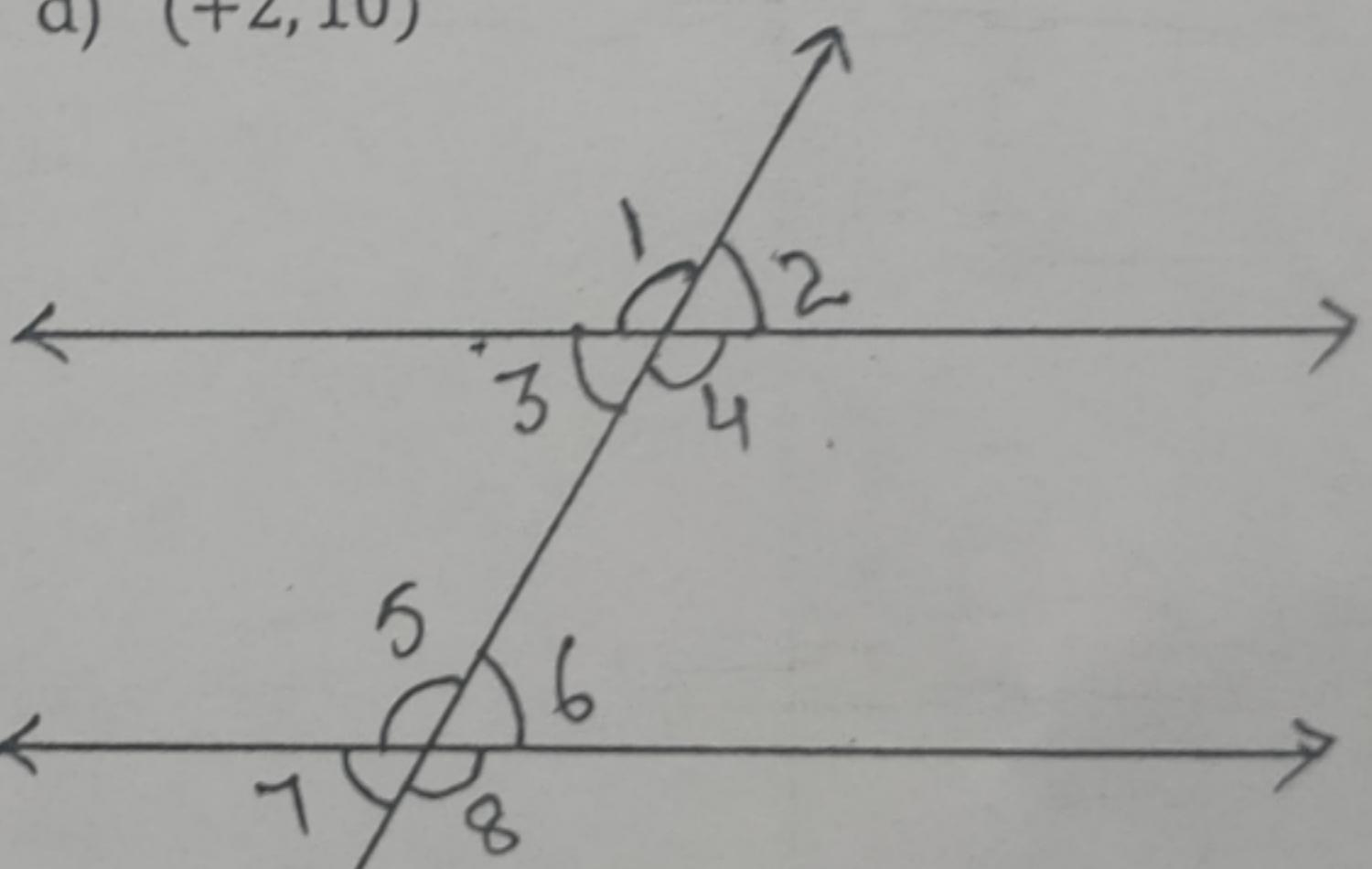


16. The point which lies on the line  $y = -5x$  is

a)  $(-10, 12)$     b)  $(10, 12)$     c)  $(2, -10)$     d)  $(+2, 10)$

17. In figure  $\angle 4$  and  $\angle 8$  are known as

a) Corresponding angles  
b) Alternate angles  
c) Vertically opposite angles  
d) Cointerior angles



18. If  $AB = QR, BC = RP$  and  $CA = PQ$  then

a)  $\Delta ABC \cong \Delta PQR$     b)  $\Delta CBA \cong \Delta PRQ$     c)  $\Delta BAC \cong \Delta RPQ$     d)  $\Delta PQR \cong \Delta BCA$

**Assertion - Reason (for question 19 & 20)**

**Read the given statement choose the correct option:**

a) Both Assertion and Reason are true and reason is correct explanation of assertion.  
b) Both Assertion and Reason are true but reason is not correct explanation of assertion.  
c) Assertion is true but Reason is false.  
d) Assertion is false but reason is true.

19. Assertion : In  $\Delta ABC$  and  $\Delta PQR, AB = PQ, AC = PR$  and  $\angle BAC = \angle QPR \therefore \Delta ABC \cong \Delta PQR$

Reason : Both the triangles are congruent by SSA congruence.

20. Assertion : If  $\left(-\frac{3}{2}, k\right)$  is a solution of the linear equation  $2x + 3y = 0$ . Then  $k = 1$

Reason : The linear equation  $ax + b = 0$  can be expressed as a linear equation in two variables as  $ax + y + b = 0$

## Section - B

Section - B

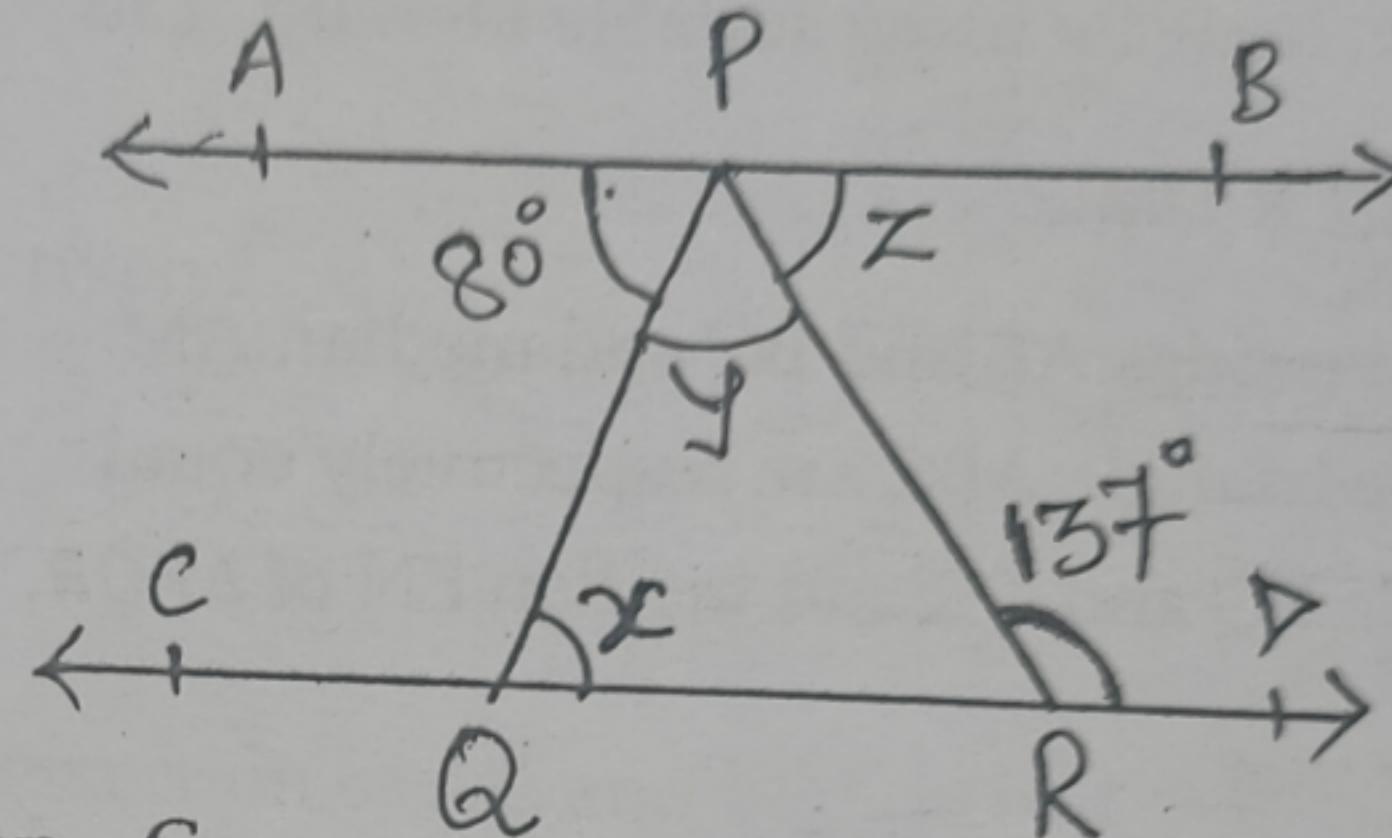
21. Locate  $\sqrt{2}$  on the number line.
22. Factorise  $4x^2 + 9y^2 + 16z^2 + 12xy - 24yz - 16xz$
23. Show that  $0.5232323 \dots$  can be expressed in form of  $p/q$  where  $p$  and  $q$  are integers and  $q \neq 0$
24. Find two solution of the equation  $y+2x = 6$

In given figure if  $AB \parallel CD$ ,  $\angle APO = 80^\circ$

25. In given figure if  $AB \parallel CD$ ,  $\angle APQ = 80^\circ$

and  $\angle PRD = 137^\circ$

Find  $x, y$  and  $z$



## Section - C

26. Given that  $\angle XYZ = 68^\circ$  and  $XY$  is produced

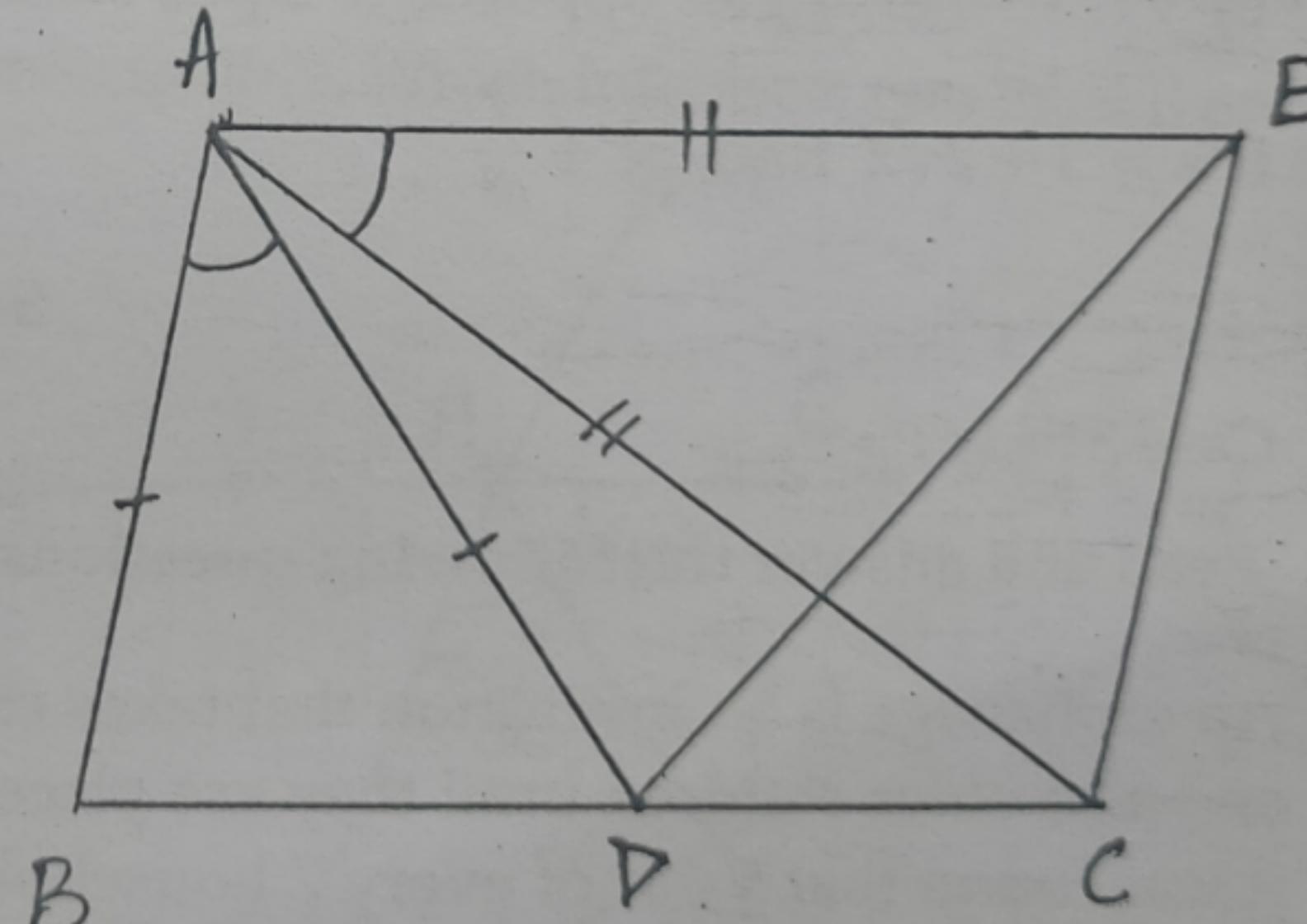
to a point P. Draw a figure from the given

information. If ray  $\overrightarrow{YQ}$  bisects  $\angle ZYP$ .

Find  $\angle XYQ$  and reflex of  $\angle QYP$

27. Verify  $x^3 + y^3 = (x + y)(x^2 - xy + y^2)$

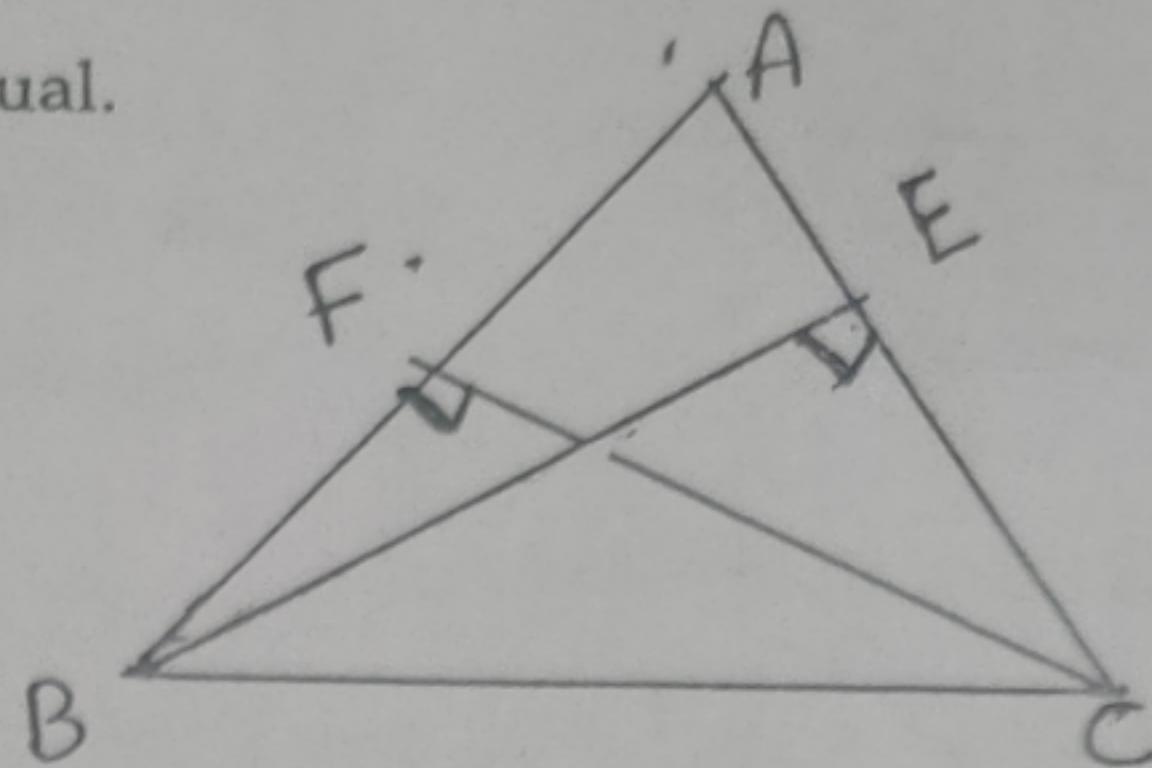
28. In an given figure  $AC = AE, AB = AD$



29. Factorise  $6x^2 + 5x - 6$  by using suitable identity

30. Find  $P(0)$ ,  $P(1)$  and  $P(2)$  if  $P(x) = 2 + x + 2x^2 - x^3$

31. ABC is an isosceles triangle in which altitudes BE and CF are drawn to equal sides AC and AB respectively. Show that these altitudes are equal.



Section - D

32. Find the value of  $\frac{4}{(216)^{-2/3}} + \frac{1}{(256)^{-3/4}} + \frac{2}{(243)^{-1/5}}$

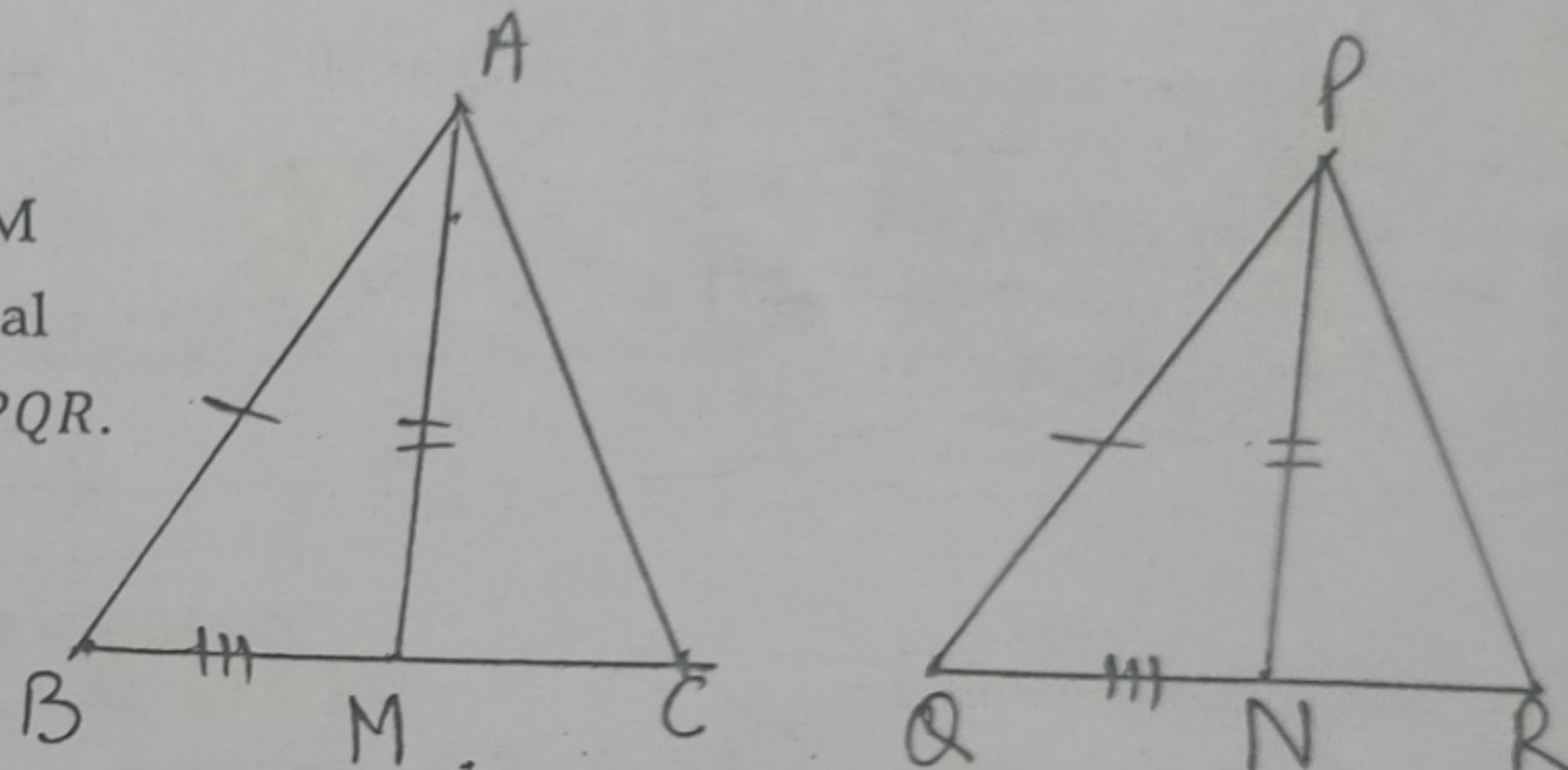
33. a) Evaluate by using suitable identity  $(3a - 2b)^3$

b)  $101 \times 102$

34. a) Two sides AB and BC and median AM of one triangle ABC are respectively equal to side PQ and QR and median PN of  $\triangle PQR$ .

Show that

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



b) Prove that angles opposite to equal sides of an isosceles triangles are equal.

35. If  $a = 3 + 2\sqrt{2}$  find  $a^2 + \frac{1}{a^2}$

Section - E

Case Study :

36. Read and answer the following questions:

An orphanage is an institution that takes care of orphans. An orphanage cares for small babies and also older children until they are placed in homes and adopted. A survey was conducted. It was found that 5 out of every 7 households are donating some amount of their income to orphanage or old age home or institution for physically handicapped.

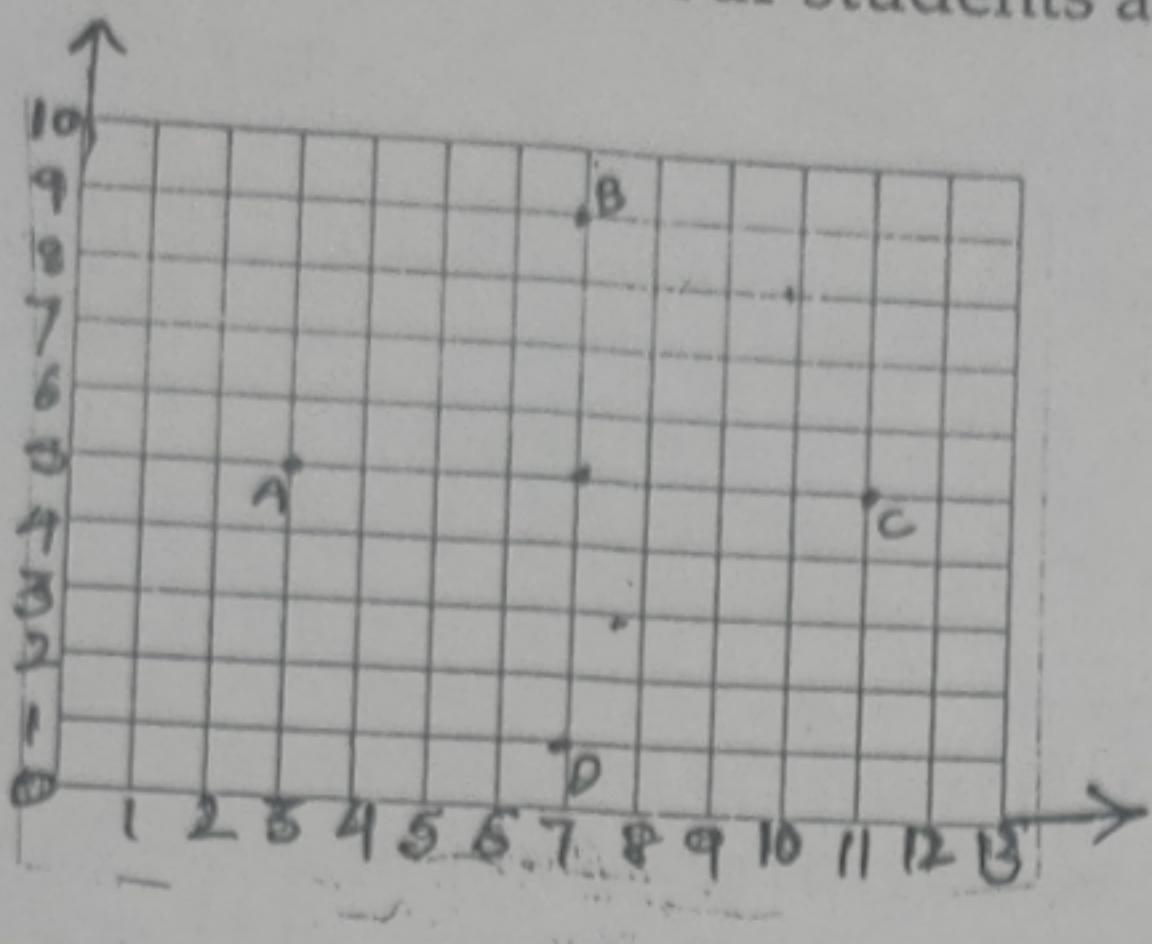
a) Find the fraction of households which are donating.  
 b) Which type of decimal expansion in  $\frac{5}{7}$  has  
 c) Write the decimal form of  $\frac{2}{7}$

OR

Write the decimal form of  $\frac{5}{7}$

37. Read and answer the following questions:

Students of a school are standing in rows and columns in their playground for a drill practice. A, B, C and D are the positions of four students as shown in the figure.



- What are the coordinates of A and B.
- What are the coordinates of C and D respectively?
- What is the distance between A and C?

OR

What are the coordinates of the point of intersection of AC and BD?

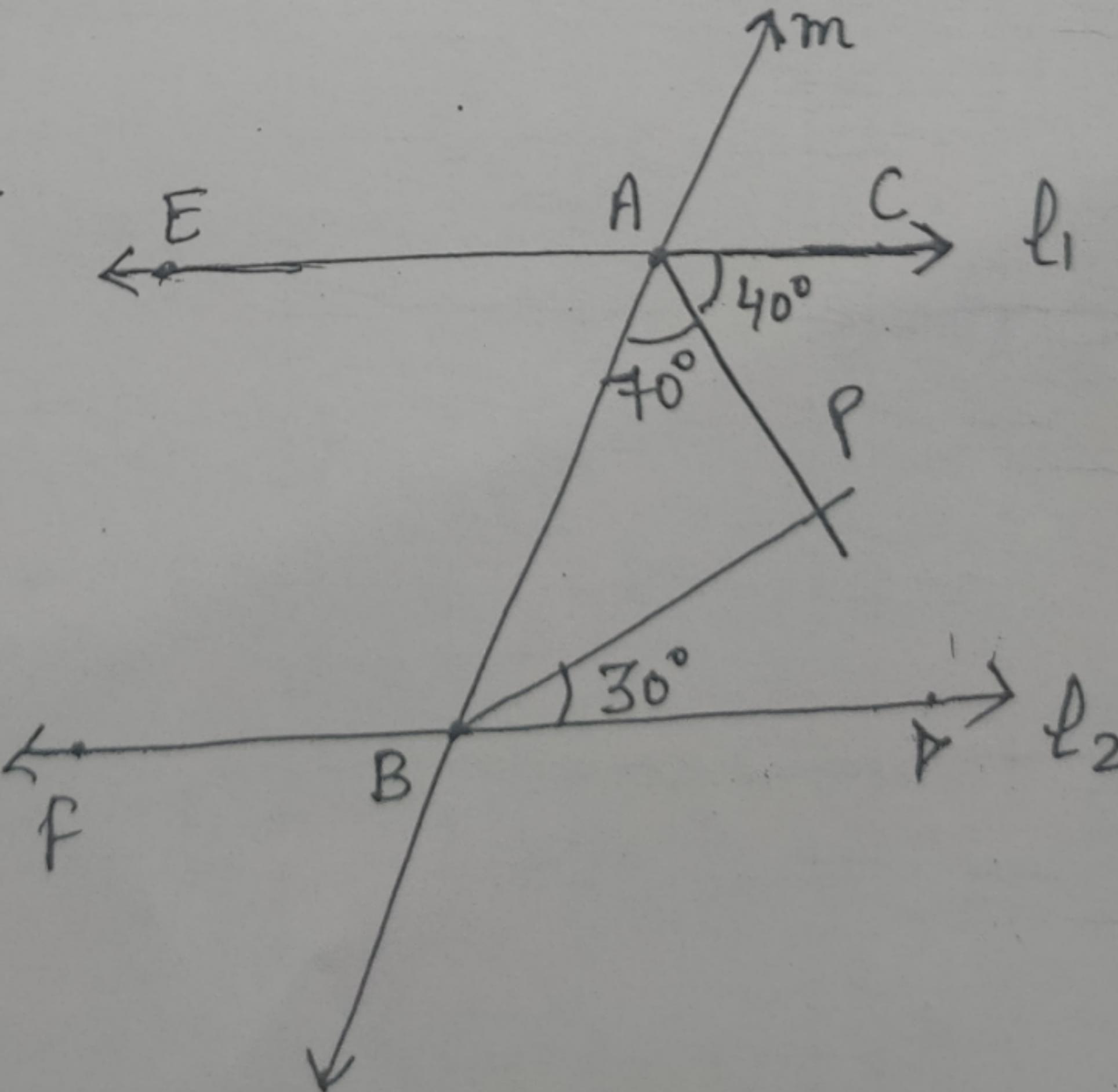
38. Read and answer the following questions:

A class teacher says to the students, make a banner for 'Swachh Bharat'. Which is defined such as  $l_1$  and  $l_2$  are two parallel lines and m is a transversal line. Which intersects two lines  $l_1$  and  $l_2$  at A and B, respectively.

- Find the  $\angle ABB$
- Determine  $\angle EAB$
- Find  $\angle ABD$

OR

Find  $\angle FBA$



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**Section-A**

1. Which of the following is irrational?  
a)  $\sqrt{\frac{4}{9}}$     b)  $\frac{\sqrt{12}}{\sqrt{3}}$     c)  $\sqrt{7}$     d)  $\sqrt{81}$
2. Every rational number is  
a) a natural number    b) an integer    c) a real number    d) a whole number
3. If  $x = 7 + 4\sqrt{3}$  then the value of  $\frac{1}{x}$  is  
a)  $\frac{1}{7-4\sqrt{3}}$     b)  $7 - 4\sqrt{3}$     c)  $\frac{1}{7+4\sqrt{2}}$     d)  $7 + 4\sqrt{3}$
4. The value of  $(1^3 + 2^3 + 3^3)^{1/2}$  is  
a)  $6^3$     b)  $6^2$     c) 6    d) 36
5. Point  $(5, -3)$  lies in the  
a) first quadrant    b) second quadrant    c) third quadrant    d) fourth quadrant
6. Degree of the polynomial  $4x^4 + 0x^3 + 0x^5 + 5x + 7$  is  
a) 4    b) 5    c) 3    d) 7
7. If  $(2, 0)$  is a solution of the linear equation  $2x + 3y = K$ , then value of  $K$  is  
a) 4    b) 6    c) 5    d) 2
8. The perpendicular distance of the point  $P (3, 4)$  from the  $y-axis$  is  
a) 3    b) 4    c) 5    d) 7
9. Degree of non zero constant polynomial is  
a) zero    b) one    c) any real number    d) not defined

10. The angles of a triangle are in the ratio 5:3:7 the triangle is

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

11. In  $\Delta ABC, BC = AB$  and  $\angle B = 80^\circ$  then  $\angle A$

- a)  $80^\circ$
- b)  $40^\circ$
- c)  $50^\circ$
- d)  $100^\circ$

12. Which of the following is not a criteria for congruency?

- a) SSS
- b) AAA
- c) ASA
- d) RHS

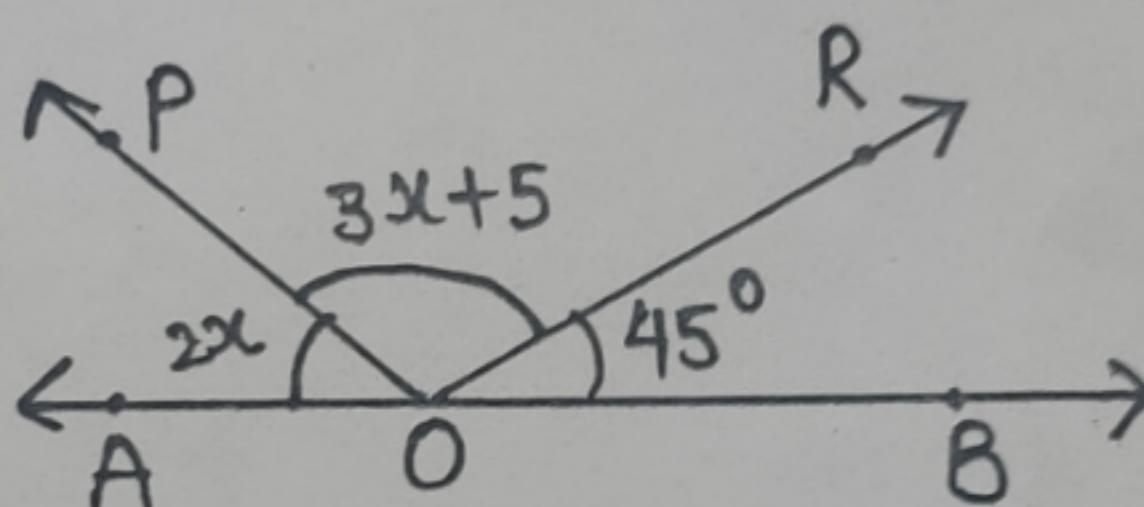
13. What is the measure of an angle whose measure is  $32^\circ$  less than its supplement?

- a)  $148^\circ$
- b)  $60^\circ$
- c)  $74^\circ$
- d)  $55^\circ$

14. The figure below AoB is a straight line.

Calculate the measure of  $\angle POR - \angle POA$

- a)  $26^\circ$
- b)  $31^\circ$
- c)  $83^\circ$
- d)  $35^\circ$



15. Find  $P(2)$  if  $P(t) = 2 + t + 2t^2 - t^3$

- a) 0
- b) -4
- c) 2
- d) 4

16. Zero of the polynomial  $P(a) = 6a + 4$  is

- a)  $\frac{2}{3}$
- b)  $\frac{3}{2}$
- c)  $-\frac{2}{3}$
- d)  $-\frac{3}{2}$

17. In triangles  $ABC$  and  $DEF$ ,  $AB = FD$  and  $\angle A = \angle D$ . The two triangles will be congruent by SAS axiom if

- a)  $BC = EF$
- b)  $AC = DE$
- c)  $AC = EF$
- d)  $BC = DE$

18. The polynomial of type  $P(x) = ax^2 + bx + c$  is

- a) Linear
- b) Quadratic
- c) Cubic
- d) Biquadratic

**Assertion - Reason (for question 19 & 20)**

**Read the given statement choose the correct option:**

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19. Assertion : If  $(-\frac{3}{2}, k)$  is a solution of the linear equation  $2x + 3y = 0$ . Then  $k = 1$

Reason : The linear equation  $ax + b = 0$  can be expressed as a linear equation in two variables as  $ax + y + b = 0$

20. Assertion : In  $\Delta ABC$  and  $\Delta PQR$ ,  $AB = PQ$ ,  $AC = PR$  and  $\angle BAC = \angle QPR \therefore \Delta ABC \cong \Delta PQR$

Reason : Both the triangles are congruent by SSA congruence.

### Section - B

21. Locate  $\sqrt{5}$  on the number line.

22. Factorise  $64m^3 + 343n^3$

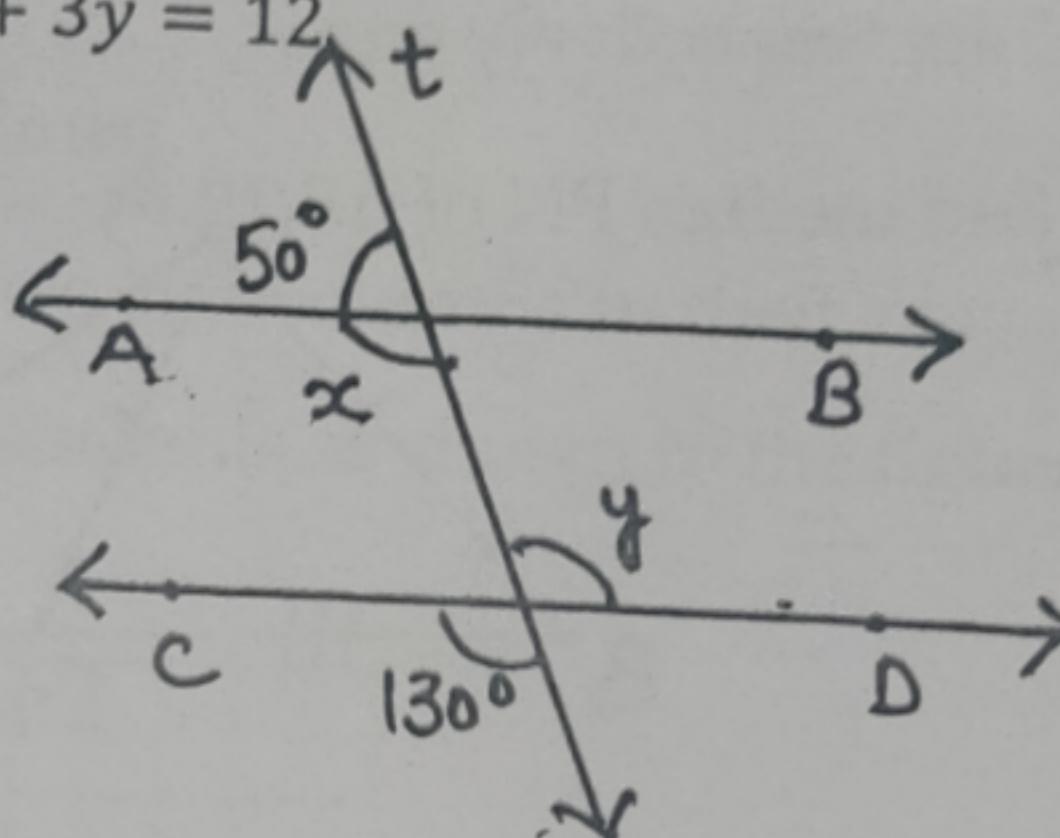
23. Express  $0.404040 \dots$  in the form of  $\frac{p}{q}$  where  $p$  and  $q$  are integers and  $q \neq 0$

24. Find two solution of the equation  $4x + 3y = 12$

25. In given figure find the value of

$x$  and  $y$  and then

show that  $AB \parallel CD$



### Section - C

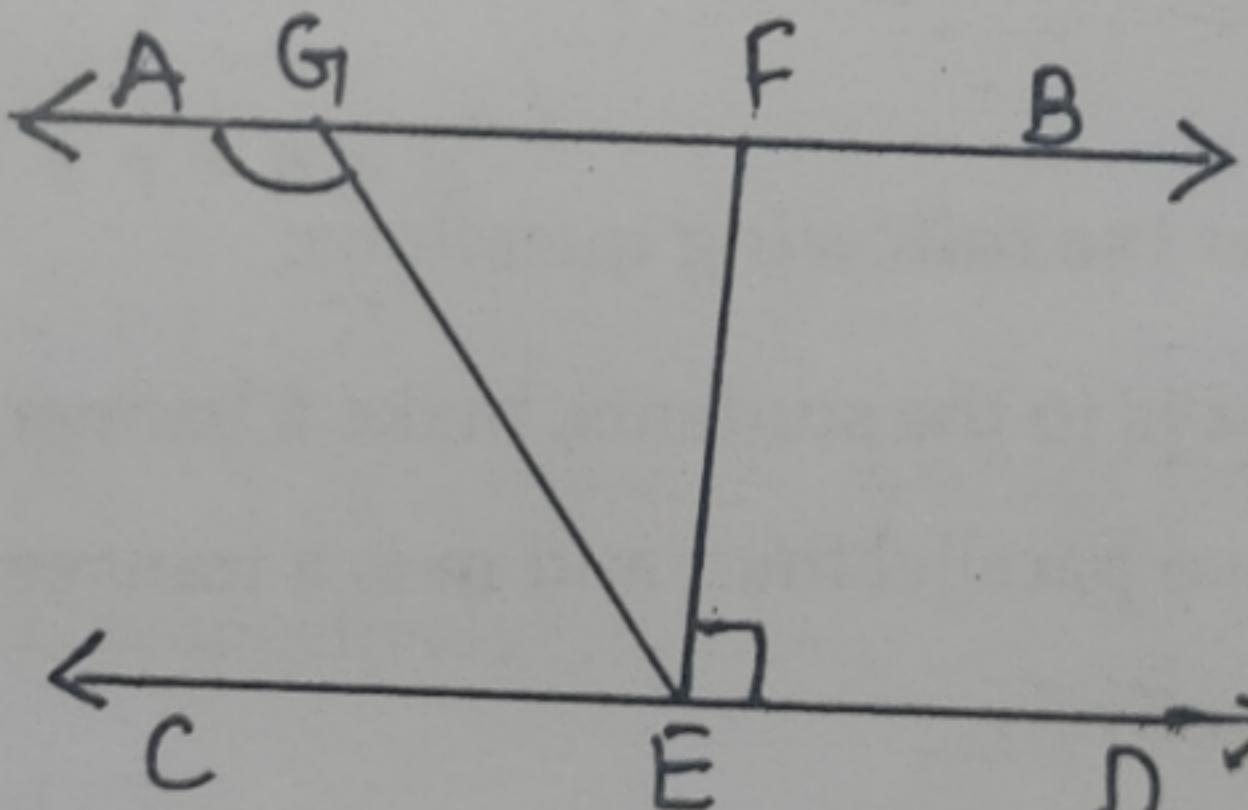
26. Verify  $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$

27. Factorise  $12x^2 - 7x + 1$

28. In figure if  $AB \parallel CD$ ,  $EF \perp CD$

and  $\angle GED = 136^\circ$

find  $\angle AGE$ ,  $\angle GEF$  and  $\angle FGE$



29. Prove that if two lines intersect each other, then the vertically opposite angles are equal.

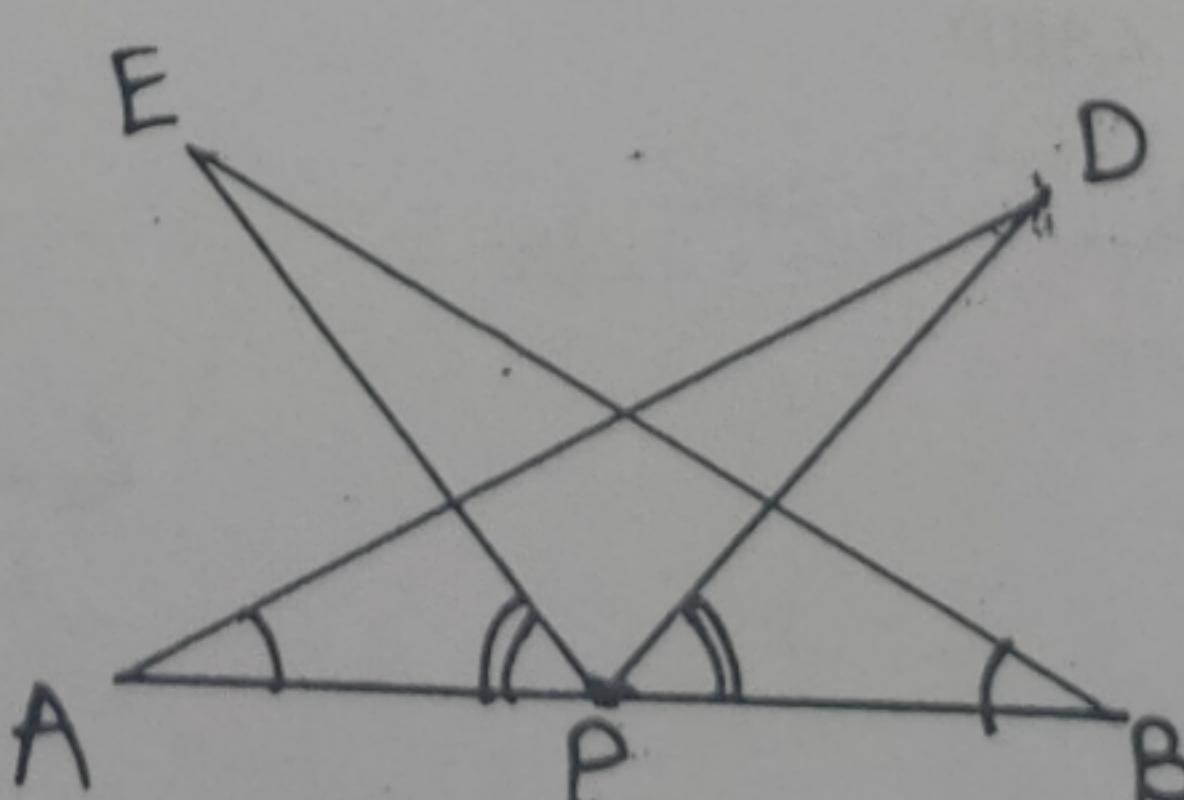
30. AB is a line segment and P is its mid point.

D and E are points on the same side of AB

Such that  $\angle BAD = \angle ABE$  and  $\angle EPA = \angle DPB$

Show that

i)  $\Delta DAP \cong \Delta EBP$  ii)  $AD = BE$



31. a) Factorise  $(-2x + 5y - 3z)^2$

b) Find the value of  $k$  if  $x - 1$  is a factor of  $4x^3 + 3x^2 - 4x + k$

### Section - D

32. Find the value of  $a$  if  $\frac{3-\sqrt{5}}{3+2\sqrt{5}} = a\sqrt{5} - \frac{19}{11}$

33. a) Evaluate the following using suitable identity  $(3a - 4b)^3$

b) Evaluate the following product without multiplying directly  $104 \times 96$

34. Two sides  $AB$  and  $BC$  and median  $AM$

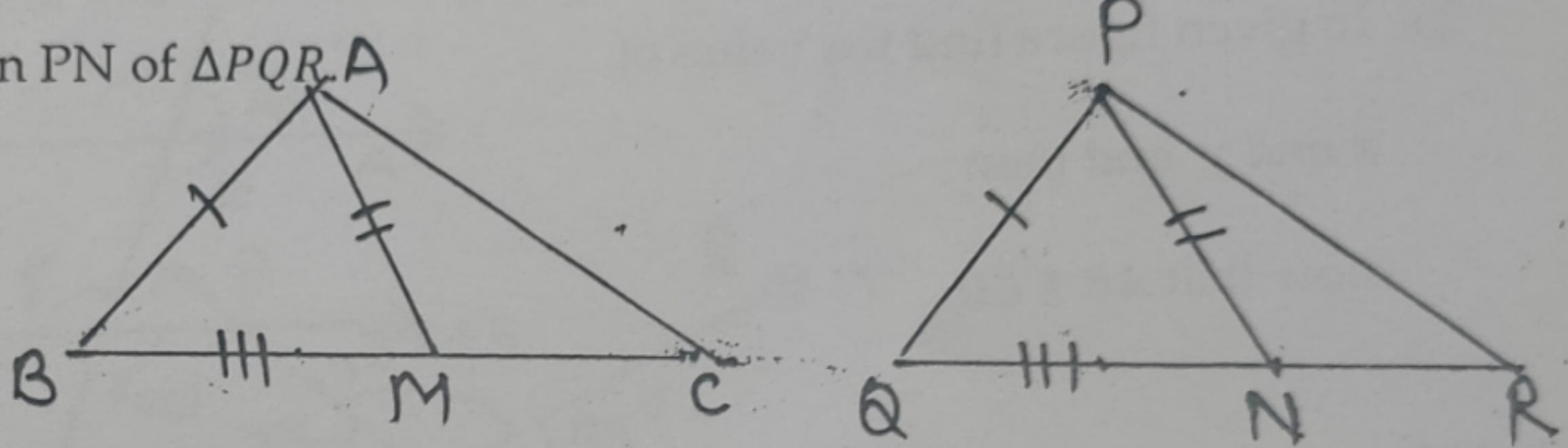
of one triangle  $ABC$  are respectively equal

to side  $PQ$  and  $QR$  and median  $PN$  of  $\triangle PQR$ .

Show that

i)  $\triangle ABM \cong \triangle PQN$

ii)  $\triangle ABC \cong \triangle PQR$



35. Simplify  $\frac{4}{(729)^{-1/6}} + \frac{2}{(256)^{-3/4}} + \frac{3}{(125)^{-1/3}}$

### Section - E

#### Case Study :

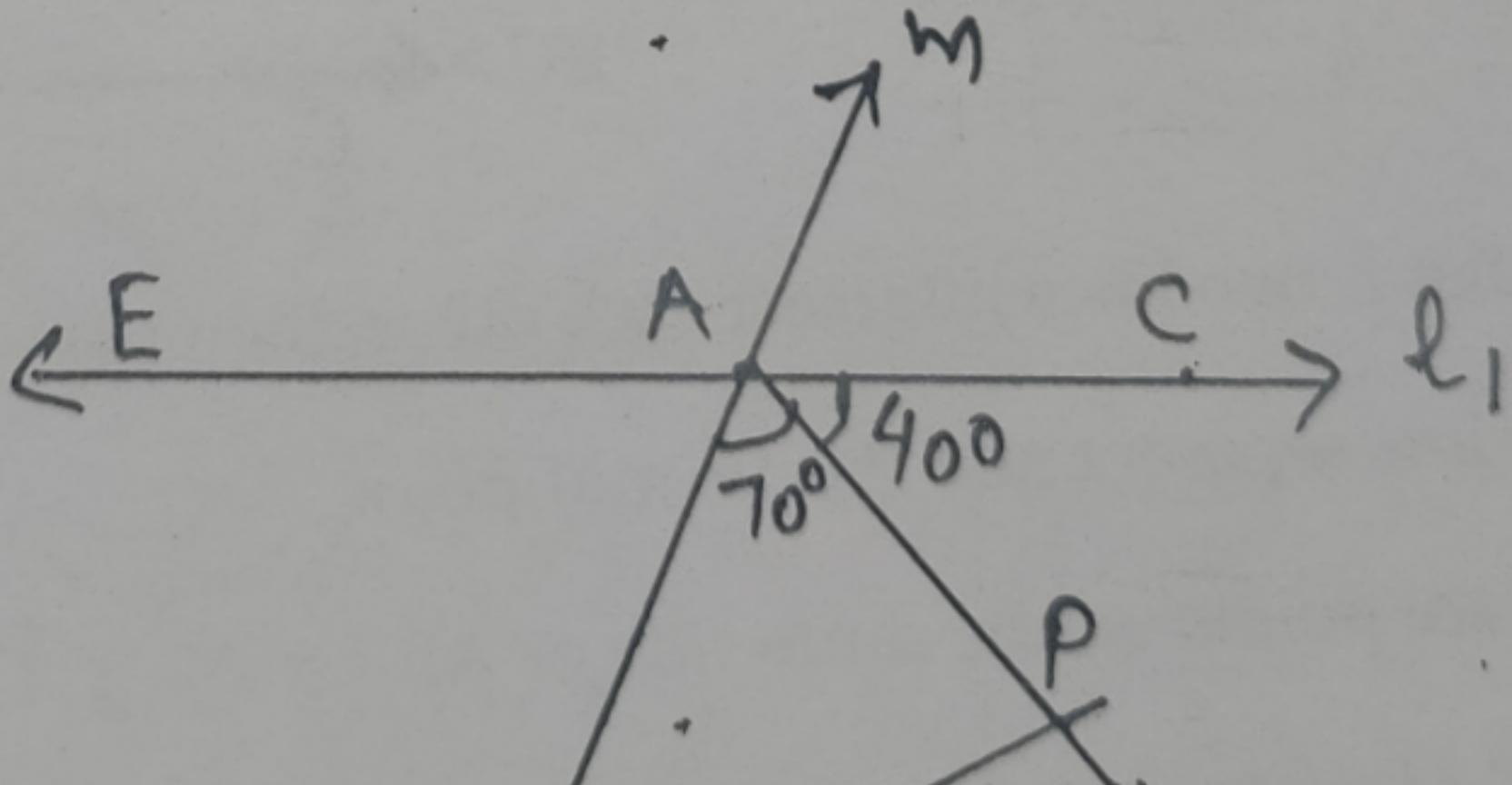
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a) Find the  $\angle ABP$

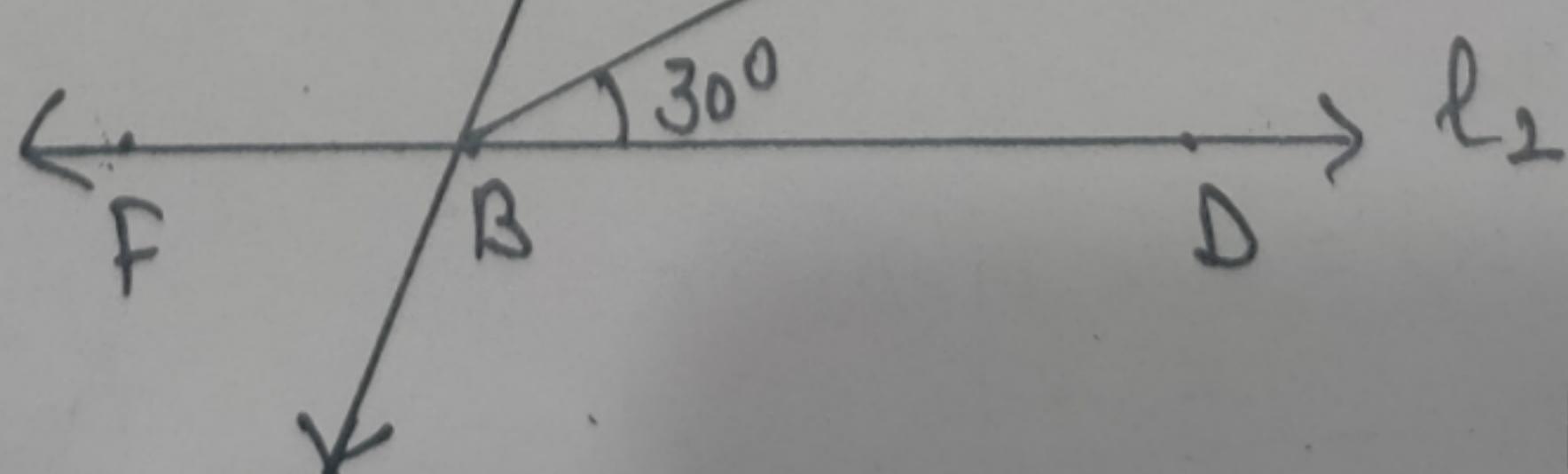
b) Determine  $\angle EAB$

c) Find  $\angle ABD$



OR

Find  $\angle FBA$



B-4

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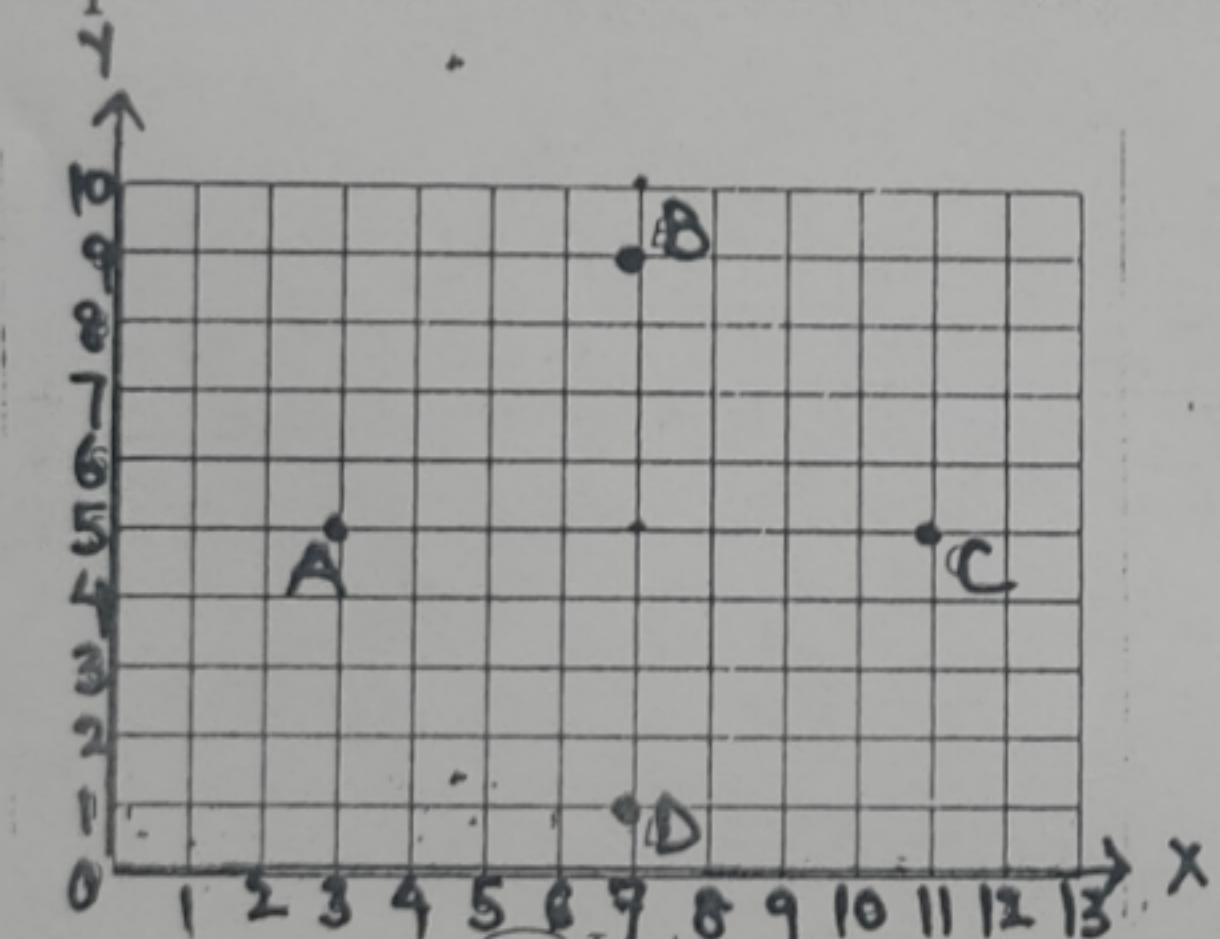
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A, B, C and D are the positions of four students as shown in the figure.



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- What are the coordinates of C and D respectively?
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OR

What are the coordinates of the point of intersection of AC and BD?