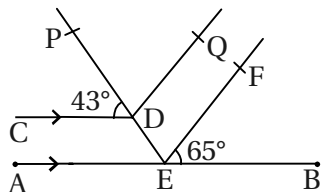


Section A

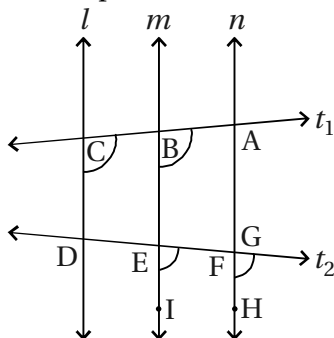
- Write the answer of the following questions. [Each carries 1 Mark]

[8]

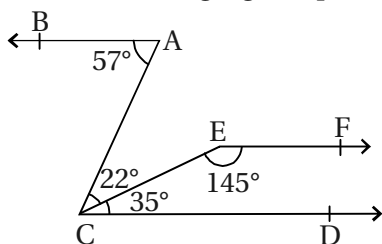
1.  $AB \parallel CD$ ,  $EF \parallel DQ$  in the following figure. Find  $\angle PDQ$ ,  $\angle AED$  and  $\angle DEF$ .



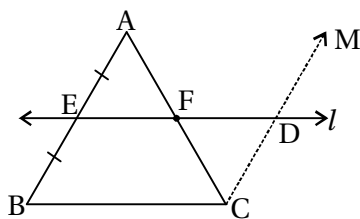
2. As shown in figure,  $t_1$  and  $t_2$  are transversals of the lines  $l$ ,  $m$ , and  $n$ .  $\angle ABE = \angle BCD$  and  $\angle FEI = \angle GFH$  prove that  $l \parallel n$ .



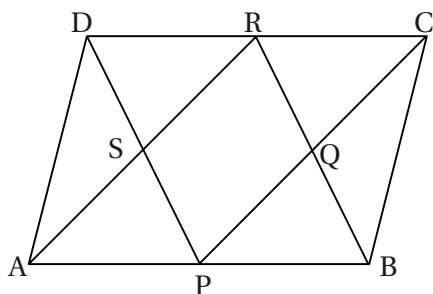
3. In the following figure, prove that  $AB \parallel EF$ .



4. The line drawn through the midpoint of one side of a triangle, parallel to another side bisects the third side.



5.  $\square ABCD$  is a parallelogram P and R are mid-points of AB and CD respectively. AR intersects DP at S and BR intersects CP at Q. From the figure, answer the following figure.



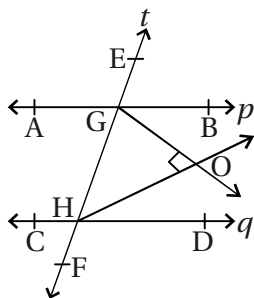
A quadrilateral PQRS is a ..... quadrilateral.

6. Factorise :  $12x^2 - 7x + 1$ .

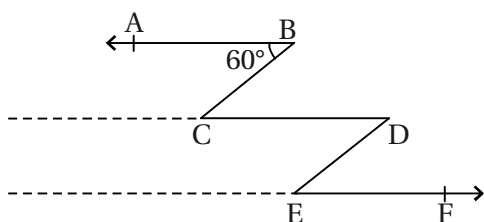
7. Write the general form of the equation  $\frac{5}{3}y + 1 = \frac{3}{5}y$ .
8. The graph of  $x = 5$  is parallel to which axis and perpendicular to which axis ?

Section B

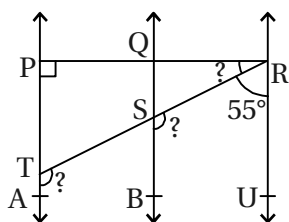
- Write the answer of the following questions. [Each carries 2 Marks] [24]
9. Line  $t$  is the transversal of lines  $p$  and  $q$ . The bisectors of interior angles on the same side of the transversal intersect each other at right angle. Prove that  $p \parallel q$ .



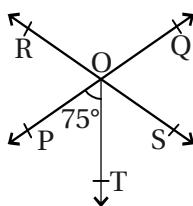
10.  $AB \parallel CD$ ,  $CD \parallel EF$  and  $BC \parallel DE$ . If  $\angle ABC = 60^\circ$  then find  $\angle DEF$ .



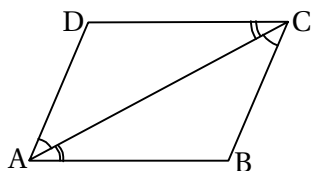
11. In figure,  $PT \parallel QS$  and  $QS \parallel RU$  and  $RU \parallel PT$ . If  $\angle TRU = 55^\circ$  then find  $\angle RTA$ ,  $\angle RSB$  and  $\angle PRS$ .



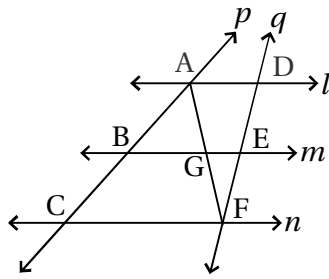
12. In the following figure,  $PQ$  and  $RS$  intersect each other at  $O$ .  $OT$  is the bisector of  $\angle POS$ .  $\angle POT = 75^\circ$  Find the measures of all the angles.



13. A diagonal of a parallelogram divides it into two congruent triangles.



14.  $l$ ,  $m$  and  $n$  are three parallel lines intersected by transversals  $p$  and  $q$  such that  $l$ ,  $m$  and  $n$  cut off equal intercepts  $AB$  and  $BC$  on  $p$  (see figure). Show that  $l$ ,  $m$  and  $n$  cut off equal intercepts  $DE$  and  $EF$  on  $q$  also.

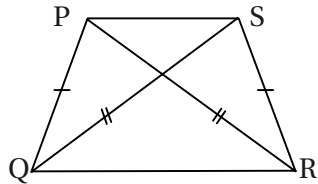


15. If  $x + y + z = 9$  and  $xy + yz + zx = 26$ , then find  $x^2 + y^2 + z^2$ .
16. Determine  $21x^3 + 16x^2 + 4x + 9$  polynomials has  $(x + 1)$  a factor ?
17. Use the factor theorem to determine whether  $g(x)$  is a factor of  $p(x)$  in the following case :  
 $p(x) = x^3 + 4x^2 + 4x + 1$ ,  $g(x) = x + 1$
18. Factorise :  $2x^3 - 13x^2 + 23x - 12$
19. Factorise the following :  $27x^3 - 64y^3 - 108x^2y + 144xy^2$
20. Factorise the following :  $64p^3 - \frac{1}{343} - \frac{48p^2}{7} + \frac{12p}{49}$

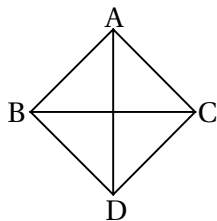
Section C

- Write the answer of the following questions. [Each carries 3 Marks] [27]

21. In the following figure;  $PQ = SR$  and  $QS = PR$ . Prove that  $\angle PQS = \angle SRP$  and  $\angle QPS = \angle RSP$ .



22. In the given figure,  $m\angle BAC = m\angle BDC = 90^\circ$  and  $\overline{BD} \cong \overline{AC}$ . Prove that,  $\triangle ABD \cong \triangle DCA$ .



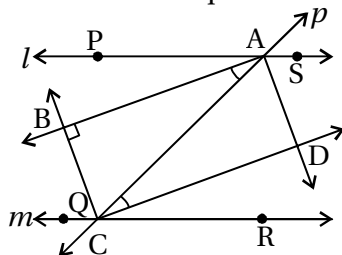
23. A ladder manufacturing company manufactures foldable step ladders of aluminum as shown in figure. The length of two legs AB and AC are both equal to 110 cm and the angle between the two legs is  $30^\circ$ . On the basis of the above information answer the following question.

[1] Find  $\angle ABC$ .

[2] If  $\angle BAC = 60^\circ$ , then find BC.

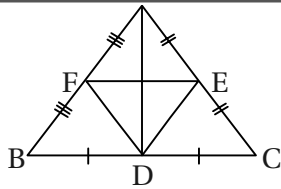
[3] In two triangles ABC and DEF, if  $\angle A = \angle D$ ,  $AB = DE$  and  $AC = DF$ , then by which congruency rule two triangles are congruent.

24. Two parallel lines  $l$  and  $m$  are intersected by a transversal  $p$  (see figure). Show that the quadrilateral formed by the bisectors of interior angles is a rectangle.



25. D, E and F are mid-points of the sides BC, CA and AB respectively in  $\triangle ABC$ . Prove that AD and EF bisect each other.

A



26. Father's Day is celebration of fathers, honouring fatherhood, paternal bonds and the role fathers place in the society. On this day children show acknowledgment and appreciation to their father for their contribution to their own families and society in large.

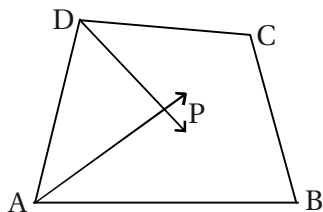
Rohan wants to show gratitude towards his father by giving him a handmade card to him. He pasted 3 trapeziums one above the other as shown below.  $AB \parallel HC \parallel GD \parallel FE$ . Also  $BC = CD = DE$  and  $GF = 6$  cm. He wants to decorate the card by putting up a coloured tape on non-parallel sides of a trapezium.

Answer the following :

- [1] What is the perimeter of trapezium HCDG if  $HC = 7$  cm,  $BC = 3$  cm and  $DG = 8$  cm ?
  - [2] Find  $\angle F$  if  $\angle A = 140^\circ$
  - [3] Find the total length of coloured tape used on the non-parallel boundary of the card. If the cost of tape is ₹ 15 per cm, find the total cost.
27. If  $a + b + c = 0$  then prove that  $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = 3$  when  $a, b, c$  are not zero together.
28. Three friends Aman, Reena and Dhruv planned to play a different game as they were bored of playing the same games. They made some cards on that algebraic expressions were written. Aman shuffled the cards. Each one picked one card. On Reena's card  $(6x^3 + 5x^2 - 9)$  was written. Dhruv's card had polynomial  $(2x^2 - 5\sqrt{3})$  and on Aman's card  $(x^2 - 9x + 20)$  was written.
- Based on the card, they started asking questions.
- [1] Find the type of polynomials of Reena's card based on the degree of polynomial.
  - [2] Find the constant term of Dhruv's card.
  - [3] Find the zeroes of polynomial of Aman's card.
29. Cleanliness drive is the way to raise awareness on the importance of cleanliness in one's neighborhood. Residents of a certain locality joined 'Cleanliness drive' together to clean their area. Participation of the women was 10 more than men. Taking 'x' as number of women and 'y' as number of men.
- [1] Write the above suitable linear equation in two variables.
  - [2] Find the number of women if number of men is 30.
  - [3] If the number of women is 5 more than twice the number of men and the total of men and women is 32. Find the number of men and women.

#### Section D

- Write the answer of the following questions. [Each carries 4 Marks] [8]
30. In the quadrilateral ABCD, AP and DP are bisectors of  $\angle A$  and  $\angle D$  respectively. Prove that  $2\angle APD = \angle B + \angle C$ .



31. Match the Part-I and Part-II properly.

Part-I		Part-II	
(i)	$(-1, 2)$	(a)	X-axis
(ii)	$(2, -1)$	(b)	Y-axis
(iii)	$(-1, -2)$	(c)	First quadrant
(iv)	$(2, 1)$	(d)	Second quadrant
(v)	$(2, 0)$	(e)	Third quadrant
		(f)	Fourth quadrant