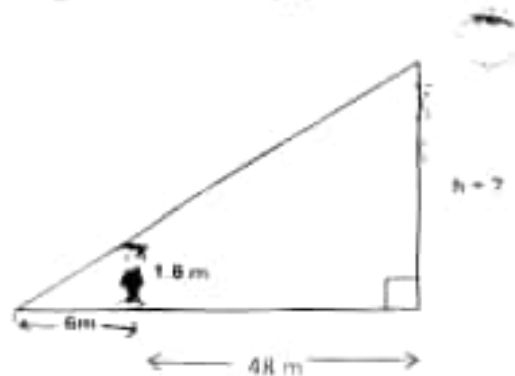


**SECTION-A**

- 1) If two positive integers  $a$  and  $b$  are written as  $a = x^4y^3$  and  $b = x^2y^5$ , where  $x$  and  $y$  are prime numbers, then find the HCF of  $a$  and  $b$ .
- 2) Find the value of 'k' so that the following system of equation has infinite solutions:  
 $3x - y - 5 = 0$ ;  $6x - 2y + k = 0$ .
- 3) Find the zeroes of the quadratic polynomial  $\sqrt{3}x^2 - 8x + 4\sqrt{3}$ .
- 4) Observe the figure and find the height of the lamp post.



- 5) The length of the diagonals of a rhombus are 30 cm & 40 cm. Find the side of the rhombus.
- 6) Find the perimeter of the triangle formed by the points A (a, 0), B (0, b) and O (0, 0).

**SECTION-B**

- 7) Find HCF and LCM of 270, 405 and 315 using Fundamental Theorem of Arithmetic

(1)

(P.T.O.)

Marks	Number of students
0-10	2
10-20	12
20-30	22
30-40	8
40-50	6

12) Show that points A (1, -1), B (5, 2) and C (9, 5) are collinear.

### SECTION-C

13) Using Euclid's division algorithm, find the largest number that divides 1251, 9377 and 15628 leaving remainders 1, 2 and 3 respectively.

14) Show that  $\frac{1}{2}$  and  $-\frac{3}{2}$  are the zeroes of the polynomial  $4x^2 + 4x - 3$  and verify the relationship between zeroes and coefficients of polynomial.

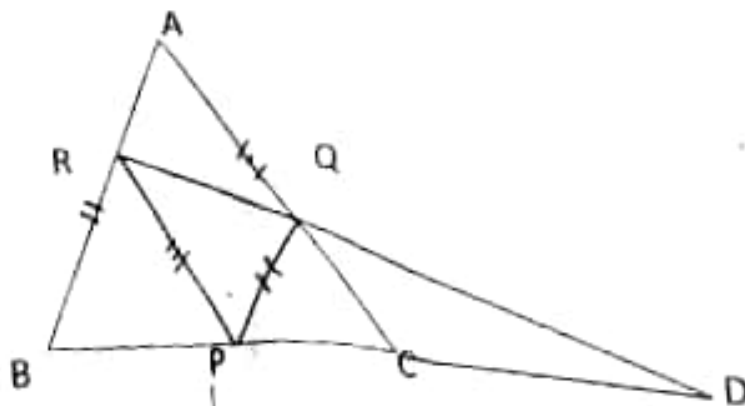
15) Divide  $3x^5 - 2x^4 + x^2 - 2$  by  $x^2 + x + 1$  and check your answer using division algorithm.

16) Solve the following system of equations for x and y:

$$\frac{5}{x-1} + \frac{1}{y-2} = 2 \quad ; \quad \frac{6}{x-1} - \frac{3}{y-2} = 1$$

17) Sum of the digits of a two-digit number is 12. The number obtained by interchanging the two digits exceeds the given number by 18. Find the number.

18) In the given figure,  $PQ \parallel BA$  and  $PR \parallel CA$ . If  $PD = 12$  cm, find  $BD \times CD$ .



(2)

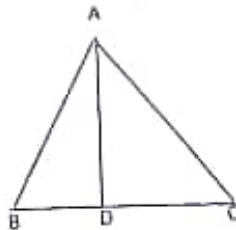
- 19) The mean of the following distribution table is 50. But the frequencies  $f_1$  and  $f_2$  in classes 20 - 40 and 60 - 80 are missing. Find the missing frequencies.

Class Interval	Frequency
0-20	17
20-40	$f_1$
40-60	32
60-80	$f_2$
80-100	19
Total	120

- 20) Find the mode of the following data:

Class Interval	Frequency
0-10	5
10-20	8
20-30	7
30-40	12
40-50	28
50-60	20
60-70	13
70-80	7

- 21) If A (4, -6), B (3, -2) and C (5, 2) are the vertices of  $\triangle ABC$ , then verify the fact that a median of a triangle ABC divides it into two triangles of equal areas.
- 22) In the figure,  $AD \perp BC$  and  $BD = \frac{1}{3} CD$ . Prove that  $2CA^2 = 2AB^2 + BC^2$ .



**SECTION - D**

- 23) Prove that  $\sqrt{3}$  is an irrational number. Hence, show that  $5 - 2\sqrt{3}$  is an irrational number.
- 24) State and prove Pythagoras theorem.
- 25) Obtain all the zeroes of  $x^4 - 7x^3 + 17x^2 - 17x + 6$ , if two of its zeroes are 3 and 1.

(3)

(P.T.O.)

- 26) Using Euclid's Division Algorithm, show that the cube of any positive integer is of the form  $9m$ ,  $9m + 1$  or  $9m + 8$ .
- 27) Draw the graphs of the equations  $x = 3$ ;  $x = 5$  and  $2x - y - 4 = 0$ . Also, find the area of the quadrilateral formed by these 3 lines and the x-axis.
- 28) If two sides and a median bisecting the third side of a triangle are respectively proportional to the corresponding sides and the median of another triangle, then prove that the two triangles are similar.
- 29) A boat goes 30 km upstream and 44 km downstream in 10 hrs. It goes 40 km upstream and 55 km downstream in 13 hours. Find the speed of the boat in still water and also the speed of the stream.
- 30) During the medical check - up of 35 students of a class, their weights were recorded as follows:

<i>Weight (in kg)</i>	<i>Number of students</i>
less than 38	0
less than 40	3
less than 42	5
less than 44	9
less than 46	14
less than 48	28
less than 50	32
less than 52	35

Draw a less than ogive for the given data. Hence obtain the median weight from the graph.