

Harsh  
IX-A

DELHI POLICE PUBLIC SCHOOL

HALF YEARLY EXAMINATION

MATHS

TIME :3HRS.

MM:80

DATE: 09/09/2024

CLASS:S1

GENERAL INSTRUCTIONS:

1) Section-A consists of 20 MCQ questions of one mark each, Section-B consists of 5 questions of 2 marks each, Section-C consists of 6 questions of 3 marks each, Section-D consists of 4 questions of 5 marks each, Section-E consists of 3 CASE STUDY QUESTIONS of 4 marks.

2) All questions are compulsory. However, an internal choice is given in some questions.

SECTION-A

Q1) Point (3,-5) lies in the

(a) First Quadrant

(b) Second Quadrant

(c) Third Quadrant

(d) Fourth Quadrant

Q2) Which of the following numbers can be represented as non-terminating, repeating decimals?

(a)  $\frac{39}{24}$

(b)  $\frac{3}{16}$

(c)  $\frac{3}{11}$

(d)  $\frac{137}{25}$

Q3) What is the distance of point (4,-3) from x-axis?

(a) 3 units

(b) 4 units

(c) 1 unit

(d) 5 units

Q4) In a  $\triangle ABC$ , if  $AB = AC$  and  $BC$  is produced to  $D$  such that  $\angle ACD = 100^\circ$ , then  $\angle A =$

(a)  $20^\circ$

(b)  $40^\circ$

(c)  $60^\circ$

(d)  $80^\circ$

Q5) Given a polynomial  $p(t) = t^4 - t^3 + t^2 + 6$ , then  $p(-1)$  is

(a) 6

(b) 9

(c) 3

(d) -1

Q6) In triangle ABC,  $BC = AB$  and  $\angle B = 80^\circ$ . Then  $\angle A =$

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

Q7) If the measure of two supplementary angles are  $(3x + 15)$  and  $(2x + 5)$ , then  $x =$

- (a) 32
- (b) 64
- (c) 14
- (d) 24

Q8) The coefficient of  $x$  for the polynomial  $x^2 - 9$  is

- (a) 0
- (b) -1
- (c) 1
- (d) -9

Q9) The solution of the linear equation  $x + 2y = 8$  which represents a point on x-axis is

- (a) (4,0)
- (b) (8,0)
- (c) (0,4)
- (d) (4,2)

Q10) If  $x = k + 1$ ,  $y = 2k - 1$  is a solution of the equation  $3x - 2y + 7 = 0$ , then  $k =$

- (a) 10
- (b) 4
- (c) 6
- (d) 12

Q11)  $\sqrt{7}$  is a polynomial of degree of

- (a) 1
- (b)  $1/2$
- (c) 0
- (d) 2

Q12) How many lines can pass through the given point (0,-8)

- (a) 1
- (b) 0
- (c) 2
- (d) Infinite

Q13) Zero of the polynomial  $p(x) = 7x - 4$  is

- (a) -4
- (b)  $4/7$
- (c)  $7/4$
- (d)  $-4/7$

Q14) Two straight lines PQ and RS cut each other at O. If  $\angle POR = 67^\circ$ , then  $\angle QOR =$

- (a)  $113^\circ$
- (b)  $107^\circ$

(c)  $123^\circ$

(d)  $133^\circ$

Q15) On dividing  $15\sqrt{15}$  by  $3\sqrt{5}$ , we get

(a)  $5\sqrt{5}$

(b)  $5\sqrt{3}$

(c)  $5\sqrt{15}$

(d)  $3\sqrt{15}$

Q16) Ordinate of all points on the x-axis is

(a) 1

(b) 2

(c) 0

(d) any number

Q17) A rational number between  $\frac{1}{2}$  and  $\frac{2}{3}$

(a)  $\frac{1}{5}$

(b)  $\frac{2}{5}$

(c)  $\frac{3}{5}$

(d)  $\frac{4}{5}$

Q18) If  $(2^3)^2 = 4^x$ , then  $x =$

(a) 3

(b) 9

(c) 6

(d) 2

**DIRECTION:** In the 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 (R) is the correct explanation of (A).

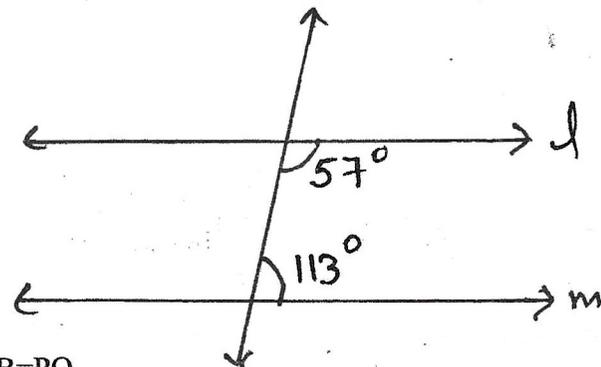
(b) Both Assertion(A) and Reason (R) are true and (R) is not the correct explanation of (A).

(c) Assertion (A) is true but Reason (R) is false.

(d) Assertion (A) is false but Reason (R) is true.

Q19) **Assertion:** In figure,  $l$  is parallel to  $m$ .

**Reason:** If a transversal intersects two lines in such a way that a pair of cointerior angles are supplementary, then lines are parallel.



Q20) **Assertion(A):**  $\Delta ABC$  is Congruent to  $\Delta PQR$ , Then  $AB=PQ$ .

**Reason(R):** Corresponding parts of congruent triangles are equal.

### SECTION-B

Q21) Without actually calculating the cubes, evaluate  $25^3 - 75^3 + 50^3$

OR

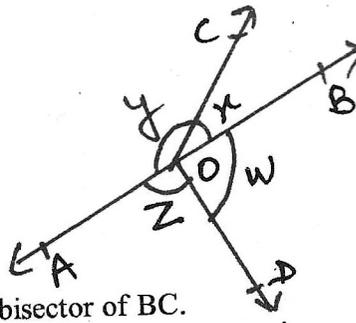
Find the value of k, if  $x - 1$  is a factor of the polynomial  $p(x) = kx^2 - 3x + k$ .

Q22) Express 0.38383838..... in the form of  $p/q$ , where p and q are integers,  $q \neq 0$

Q23) Find the points where  $3x + 2y = 12$  intersects x-axis and y-axis?

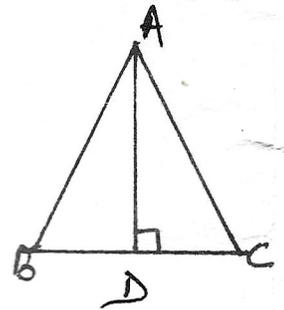
Q24) In the given figure,  $x + y = w + z$ ,

Then prove that AOB is a line.



Q25) In triangle ABC, AD is perpendicular bisector of BC.

Prove that  $AB = AC$



SECTION-C

Q26) Find a and b if

$$\frac{3 - \sqrt{5}}{3 + 2\sqrt{5}} = a\sqrt{5} + b$$

OR

If  $a = xy^{p-1}$ ,  $b = xy^{q-1}$  and  $c = xy^{r-1}$ , prove that  $a^q \cdot b^r \cdot c^{p-q} = 1$

Q27) In an isosceles triangle ABC, with  $AB = AC$ , the bisectors of  $\angle B$  and  $\angle C$  intersect each other at point O, Join AO. Show that

(i)  $OB = OC$

(ii) AO bisects  $\angle A$ .

OR

AD is an altitude of an isosceles triangle ABC in which  $AB = AC$ . Show that

(i) AD bisects BC

(ii) AD bisects  $\angle A$

Q28) Factorise:  $x^3 - 2x^2 - x + 2$

Q29) Plot the points  $(-1,0)$ ,  $(1,0)$ ,  $(1,1)$ ,  $(0,2)$ ,  $(-1,1)$  and join them in order. What figure do you get?

Q30) Draw the graph of the equation  $2x + y = 6$ . Also, find the coordinates of the points where the graph cuts the x-axis and y-axis.

Q31) Prove that if two lines intersect each other then vertically opposite angles are equal.

### SECTION-D

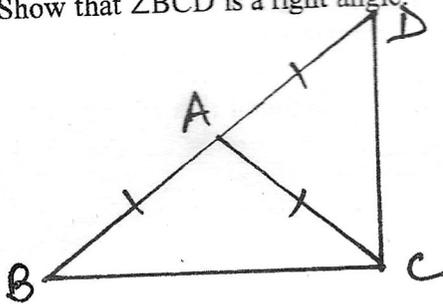
Q32) If  $(5)^{2x-1} - (25)^{x-1} = 2500$ , then find the value of x.

OR

(i) Represent  $\sqrt{10}$  on the Real number line.

(ii) Using appropriate identity, calculate  $(101)^3$

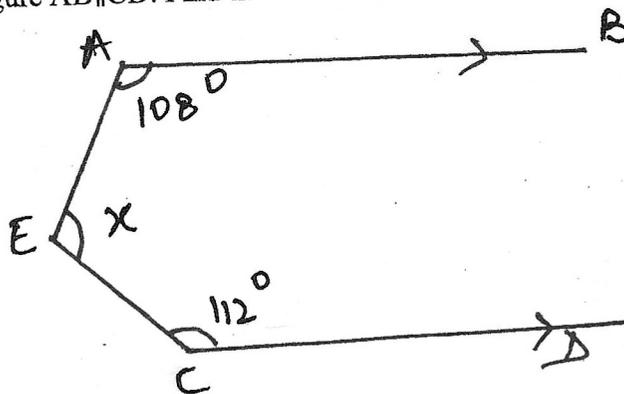
Q33)  $\triangle ABC$  is an isosceles triangle in which  $AB = AC$ . Side BA is produced to D such that  $AD = AB$ . Show that  $\angle BCD$  is a right angle.



Q34) Factorise:  $a^7 - ab^6$

(ii) If  $a + b = 12$  and  $ab = 27$ , find the value of  $a^3 + b^3$ .

Q35) In Figure  $AB \parallel CD$ . Find x.



### SECTION-E (CASE STUDY QUESTION):

Q36) The taxi fare in Delhi is as follows:

For the first Kilometer, the fare is Rs.20 and for the subsequent distance, it is Rs.12 per Km.

Refer the given information and answer the following questions by taking the distance covered as  $x$  Km and the total fare as Rs. $y$ .

- (i) Write the linear equation for the above mentioned information. [1]
- (ii) Express the linear equation obtained in (i) in the form of  $ax + by + c = 0$  and indicate the values of  $a$ ,  $b$  and  $c$ . [1]
- (iii) Is Seema has hired the taxi for 26Km, then find the amount to be paid by her as taxi fare.

OR

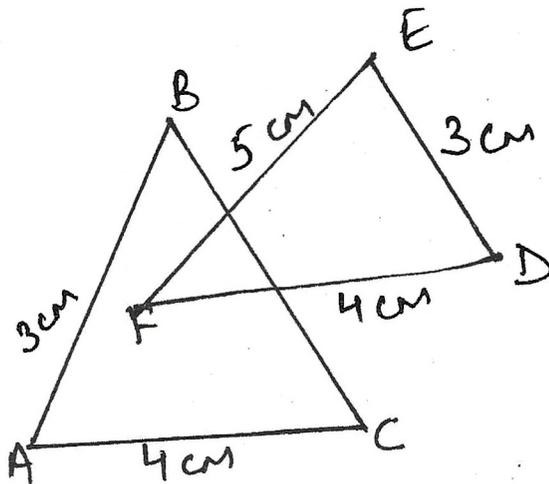
Using variables  $x$  and  $y$ , write a linear equation whose solution is  $(a, -a)$ . [2]

**Q37)** Sanjana and Anshu are two friends, both of them are fond of eating chips and suddenly Sanjana noticed that all chips look alike and she recalled the chapter of Triangle that had been taught by the teacher in school.

She decided to measure the sides of the chips and she found that all chips were of same measurement 3cm, 4cm and 5cm, as shown in figure.

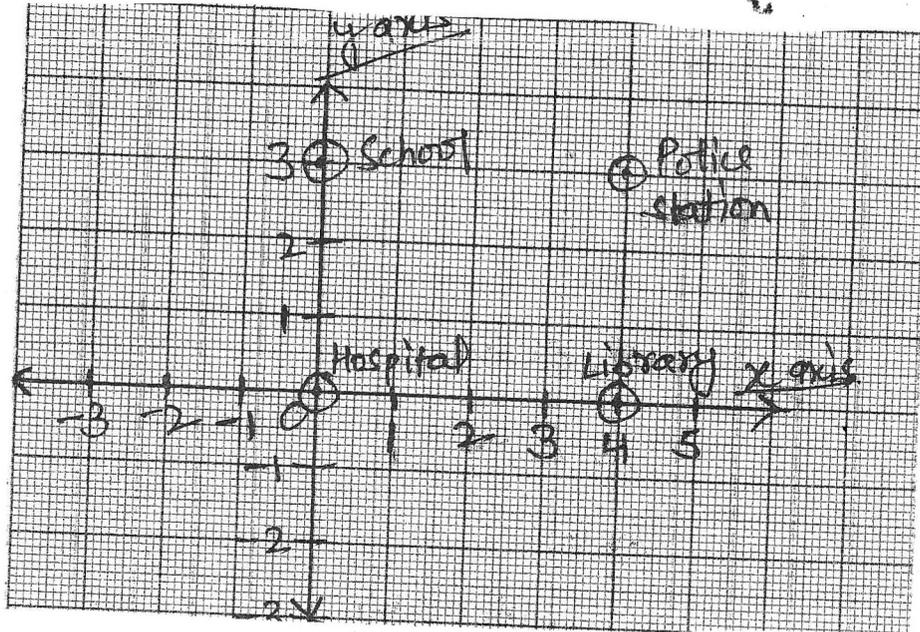
Based on the above information, answer the following question:

- (i) Which type of triangle were the chips? [1]
- (ii)  $BC =$  \_\_\_\_\_ [2]  
 $\angle A =$  \_\_\_\_\_
- (iii) Were the triangular chips congruent? If yes, then write the property used for congruency. [1]



**Q38)** Aditya is a class IX student residing in a village. One day, He went to a City Hospital along with his grand daughter for general checkup. From there he visited three places-

School, Library and Police Station. After returning to his village, He plotted a graph by taking Hospital as origin and marked three places on the graph as per his direction of movement and distance. The graph is shown below:



- (i) What are the coordinates of School and Police Station?  
[2]
- (ii) What is the distance between School and Police Station?  
[1]
- (iii) Name the type of Quadrilateral obtained if you join all four places.  
[1]