



ORCHIDS

The International School

GRADE: X

Periodic Assessment – 1 (2025-26)

DATE: 03-07-2024

TIME: 1 hr 30 mins

SUBJECT: MATHEMATICS

MARKS: 40

General Instructions:

1. This paper is divided into five sections: A, B, C, D and E. All questions are compulsory.
2. Section A has 10 MCQs carrying 1 mark each
3. Section - B has 3 questions carrying 02 marks each
4. Section - C has 2 questions carrying 03 marks each
5. Section - D has 2 questions carrying 05 marks each
6. Section E has 2 case based integrated units of assessment (04 marks each) with sub- parts of the values of 1, 1 and 2 marks each respectively
7. Questions are compulsory. However, an internal choice in 1 Qs of 5 marks, 1 Qs of 3 marks and 1 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E.

SECTION – A

Section A consists of 10 questions of 1 mark each:

10 × 1 = 10M

1. 7^n , where n is a natural number, cannot end with the digit :
A) 1 B) 7 C) 4 D) 9
2. If -4 is a zero of the polynomial $p(x) = x^2 - x - (2 + 2k)$, then the value of k is:
A) 3 B) 9 C) 6 D) -9
3. The value of m for which lines $14x + my = 20$ and $-3x + 2y = 16$ are parallel, is :
A) $-\frac{3}{14}$ B) $-\frac{7}{3}$ C) $-\frac{28}{3}$ D) $-\frac{3}{28}$
4. The roots of the equation $x^2 - 27 = 0$ are
A) rational and distinct B) irrational and distinct C) real and equal D) not real
5. 10th term of the A.P. : $-12, -19, -26, \dots$ is
A) -75 B) -65 C) 51 D) -82
6. The distance between the points $(2, -3)$ and $(-2, 3)$ is :
A) $2\sqrt{13}$ units B) 5 units C) $13\sqrt{2}$ units D) 10 units

7. The sum of exponents of prime factors in the prime factorization of 4004 is

- A) 5 B) 4 C) 3 D) 2

8. If the zeroes of the quadratic polynomial $x^2 + (a+1)x + b$ are 2 then

- A) $a = -7, b = -1$ B) $a = 5, b = -1$ C) $a = 2, b = -6$ D) $a = 0, b = -6$

DIRECTION: In question number 9 and 10, a statement of **assertion (A)** is followed by a statement of **Reason(R)**. Choose the correct option.

9. **Assertion (A):** The value of k for which the system of equations $3x + ky = 0$ and $2x - y = 0$ has a unique solution is $k \neq \frac{-3}{2}$

Reason(R): The graph of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ gives a pair of intersecting lines if $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

- A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)
B) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)
C) Assertion (A) is true but reason (R) is false.
D) Assertion (A) is false but reason (R) is true.

10. **Assertion(A):** The value of y is 6, for which the distance between the points $P(2, -3)$ and $Q(10, y)$ is 10

Reason(R): Distance between two given points $A(x_1, y_1)$ and $B(x_2, y_2)$ is given by

$$AB = \sqrt{(y_2 - y_1)^2 + (x_2 - x_1)^2}$$

- A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)
B) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)
C) Assertion (A) is true but reason (R) is false.
D) Assertion (A) is false but reason (R) is true.

SECTION - B

Section B consists of 3 questions of 2 marks each.

3 x 2 = 6M

11. Prove that $6 - 2\sqrt{3}$ is an irrational number. It is given that $\sqrt{3}$ is an irrational number.

12. Find the value of k for which the quadratic equation $kx^2 - 2kx + 6 = 0$ has real and equal roots. Also find the roots.

13. Find the ratio in which the line segment joining the points $(1, -3)$ and $(4, 5)$ is divided by x -axis? Also find the coordinates of this point on x -axis?

OR

The point R divides the line segment AB , where $A(-4, 0)$ and $B(0, 6)$ such that $3AB = 4AR$. Find the coordinates of R .

Section B consists of 2 questions of 3 marks each.

SECTION - C

2 x 3 = 6M

14. If α and β are the zeroes of the quadratic polynomial $4x^2 - x - 4$, find the quadratic polynomial whose zeroes are $\frac{2}{\alpha}$ and $\frac{2}{\beta}$.

15. The sum of the numerator and denominator of a fraction is 18. If the denominator increases by 2, the fraction reduces to $\frac{1}{3}$. Find the fraction.

OR

Solve the equations $x + 2y = 6$ and $2x - 5y = 12$ graphically.

SECTION - D

Section D consists of 2 questions of 5 marks each.

2 x 5 = 10M

16. It is given that $p^2x^2 + (p^2 - q^2)x - q^2 = 0$; ($p \neq 0$)

(i) Show that the discriminant (D) of the above equation is a perfect square.

(ii) Find the roots of the equation.

17. The digits of a positive number of three digits are in AP and their sum is 15. The number obtained by reversing the digits is 594 less than the original number. Find the number.

OR

If the sum of first m terms of an AP is the same as the sum of its first n terms, show that the sum of its first $(m+n)$ terms is zero.

SECTION - D

Read the given Case study Paragraph and answer the questions:

2 x 4 = 8M

18. Teaching Mathematics through activities is a powerful approach that enhances students and engagement. Keeping this in mind, Ms. Mukta planned a prime number game for class 5 students. She announces the number 2 in her class and asked the first student to multiply it by a prime number and then pass it to second student. Second student also multiplied it by a prime number and passed it to third student. In this way by multiplying to a prime number, the last student got 173250.

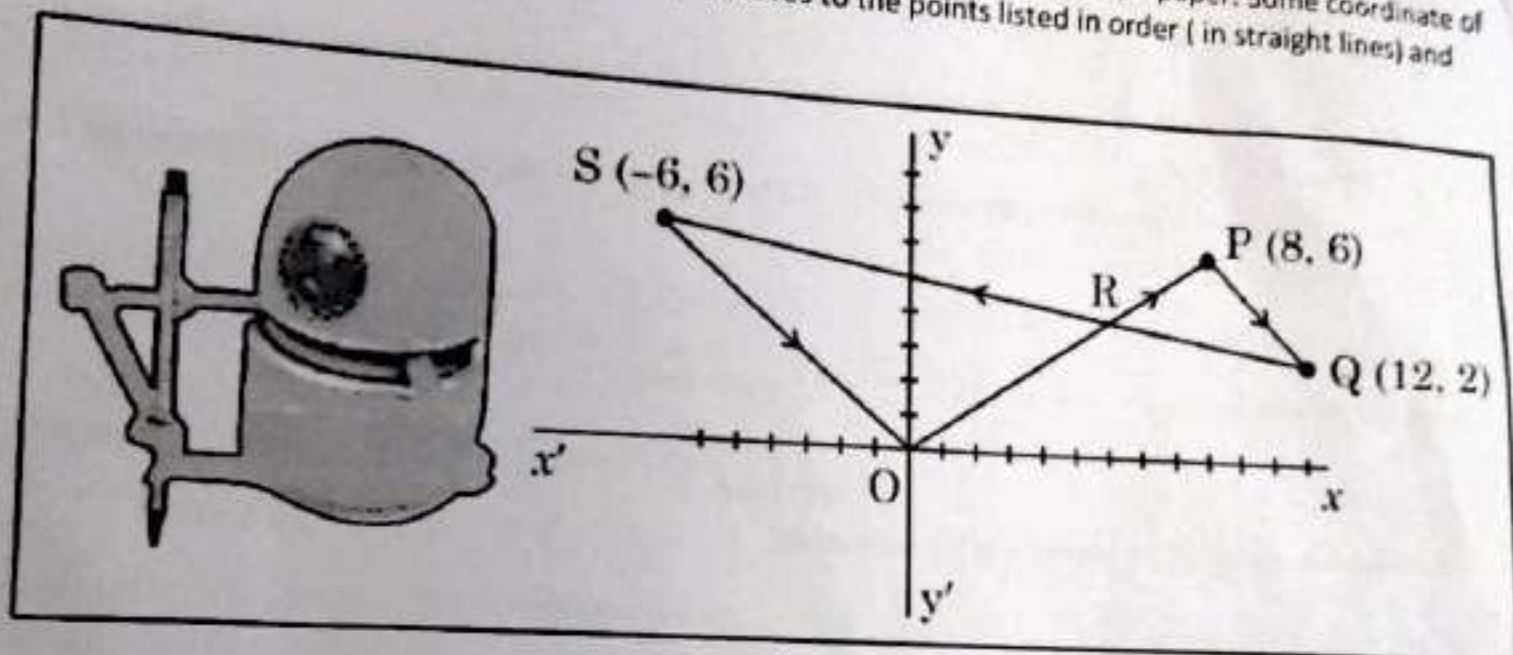
Based on the above information, solve the following questions:

- 1) What is the least prime number used by students?
- 2) What is the highest prime number used by students?
- 3) How many students are in the class?

OR

Which prime number has been used maximum times?

19) Rohit and Mohit built a robot that can paint a path as it moves on a graph paper. Some coordinate of points are marked on it. It starts from $(0,0)$, moves to the points listed in order (in straight lines) and ends at $(0,0)$.



Arushi entered the points $P(8,6)$, $Q(12,2)$ and $S(-6,6)$ in order. The path drawn by robot is shown in the figure.

Based on the above, answer the following questions:

- (i) Determine the distance OP .
 - (ii) QS is represented by equation $2x + 9y = 42$. Find the coordinates of the point where it intersects y -axis.
 - (iii) (a) Point $R(4.8, y)$ divides the line segment OP in a certain ratio, find the ratio. Hence find the value of y .
- OR**
- (iii) (b) Using distance formula, show that $\frac{PQ}{OS} = \frac{2}{3}$