



ANANDALAYA  
PERIODIC TEST – 3  
Class: XI

Subject : Mathematics (041)  
Date : 05-01-2023

M.M :40  
Time: 1hour 30 Minutes

**General Instructions:**

1. The question paper consists of 17 questions divided into 4 sections A, B, C and D
2. All questions are compulsory.
3. Section A comprises of 5 questions of 1 mark each. Internal choice has been provided in one question.
4. Section B comprises of 5 questions of 2 marks each. Internal choice has been provided in one question.
5. Section C comprises of 5 questions of 3 marks each. An internal choice has been provided in one question.
6. Section D comprises of 2 questions of 5 marks each. An internal choice has been provided in one question.

**SECTION – A**

1. Find the equation of a line perpendicular to the line  $x - 2y + 3 = 0$  and passing through the point  $A(1, -2)$ . (1)
  2. How many terms are there in the expansion of  $(1 - 2y + y^2)^3$ ? (1)
  3. The equation of the ellipse whose centre is at the origin and the x-axis, the major axis, which passes through the points  $(-3, 1)$  and  $(2, -2)$  is \_\_\_\_\_ (1)  
(A)  $5x^2 + 3y^2 = 32$  (B)  $3x^2 + 5y^2 = 32$   
(C)  $5x^2 - 3y^2 = 32$  (D)  $3x^2 + 5y^2 + 32 = 0$
  4.  $3^{1/2} \times 3^{1/4} \times 3^{1/8} \times \dots$  upto infinite terms is equal to \_\_\_\_\_ (1)  
(A)  $3^2$  (B) 3 (C)  $3^3$  (D)  $3^4$
- OR**
- 5120 is which term of the GP 5, 10, 20, 40 .....  
(A) 11<sup>th</sup> (B) 10<sup>th</sup> (C) 6<sup>th</sup> (D) 5<sup>th</sup>
  5. Slope of a line which cuts off intercepts of equal lengths on the axes is \_\_\_\_\_. (1)  
(A) -1 (B) 0 (C) 2 (D) 3

**SECTION – B**

6. Write the binomial expansion of  $(x + 3y)^5$ . (2)
7. What is the area of the triangle formed by the lines joining the vertex of the parabola  $x^2 = 12y$  to the ends of its latus rectum. (2)
8. Write the expansion of  $\left(\frac{y}{x} + \frac{x}{y}\right)^4$ , where  $x, y \neq 0$ . (2)
9. Find 6 arithmetic means between 3 and 24 (2)
10. Find the centre and radius of the circle  $x^2 + y^2 - 2x + 4y = 8$ . (2)

**OR**

Find the equation of the circle having centre  $(1, -2)$  and passing through the point of intersection of the lines  $3x + y = 14$  and  $2x + 5y = 18$ .

**SECTION – C**

11. Find the value of  $\frac{(2+\sqrt{3})^3 - (2-\sqrt{3})^3}{2\sqrt{3}}$  using binomial expansion. (3)
12. Find the eccentricity, coordinates of the foci and the length of the axes of the curve  $3x^2 + 4y^2 = 12$ . (3)

13. Calculate the distance of the point of intersection of the lines  $2x - 3y + 5 = 0$  and  $3x + 4y = 0$  from the line  $5x - 2y = 0$ . (3)

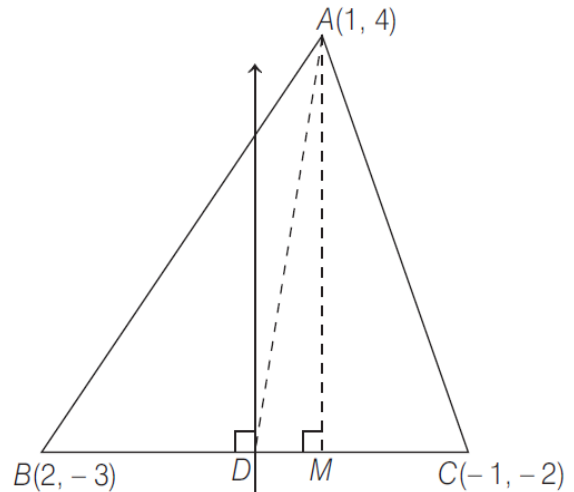
OR

A line through the points  $(-2, 6)$  and  $(4, 8)$  is perpendicular to the line through the points  $(8, 12)$  and  $(x, 24)$ . Then, find the value of  $x$ .

14. The sum of first three terms of a GP is  $\frac{13}{12}$  and their product is  $-1$ . Find the three terms of GP. (3)
15. Find the equation of hyperbola with vertices  $(\pm 2, 0)$  and foci  $(\pm 3, 0)$ , also find length of transverse axis and conjugate axis. (3)

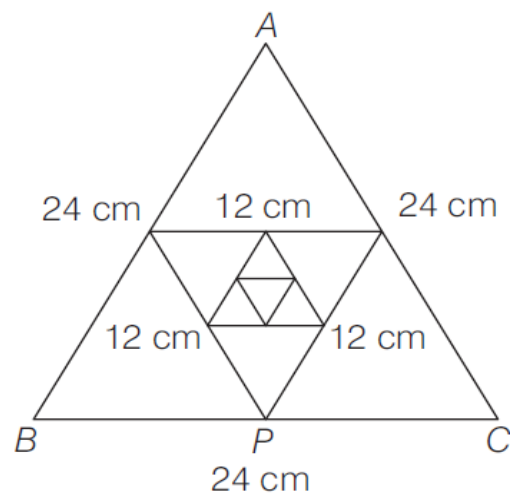
SECTION - D

16. Consider the  $\triangle ABC$  with vertices  $A(1, 4)$ ,  $B(2, -3)$  and  $C(-1, -2)$  as shown in the given figure.  $AD$  is the median and  $AM$  is the altitude through  $A$ .



- (i) Find the distance between  $A$  and  $C$ . (1)
- (ii) Find the slope of  $BC$ . (1)
- (iii) Find the equation of median through  $A$ . (1)
- (iv) What is the equation of the altitude through  $A$ . (1)
- (A)  $3x - y + 1 = 0$  (B)  $x + 2y - 3 = 0$  (C)  $x - 3y + 2 = 0$  (D)  $3x + 2y - 2 = 0$
- (v) Find the equation of right bisector of side  $BC$ . (1)
- (A)  $x + 3y - 3 = 0$  (B)  $x - 3y + 3 = 0$  (C)  $3x - y - 4 = 0$  (D)  $3x + y - 2 = 0$

17. Each side of an equilateral triangle is 24 cm. The mid-point of its sides are joined to form another triangle. This process is going continuously infinite. Based on the above information, answer the following questions.



- (i) Find the side of the 5th triangle is (in cm) (2)
- (ii) The sum of perimeter of first 6 triangle is (in cm) (2)

OR

The area of all the triangle is (in sq cm)

- (iii) The sum of perimeter of all triangle is (in cm) (1)
- (A) 144 (B) 169 (C) 400 (D) 625