VMC Vidyamandir Classes SINCE 1986
IIT JEE | MEDICAL | FOUNDATION

MOCK MATHEMATICS SUBJECTIVE TEST
CLASS – IX (SET – 2)

Maximum Marks: 80 **Duration 3.0 Hours**

Number System, Polynomials, Coordinate Geometry, Euclid's Geometry, Lines & Angles, Triangles, Heron's Formula, Linear Equation in Two Variables

General Instructions:

1. This question paper consists of **38 questions**. All questions are compulsory.
2. **Paper Pattern and Marking Scheme:**
3. There are **Five Sections** in the question paper (Section **A**, **B**, **C**, **D** and **E**).
   - In **Section A** – question numbers **1 to 20** are Multiple Choice Questions (MCQs) carrying **1** mark each.
   - In **Section B** – question numbers **21 to 25** are Very Short Answer Questions (VSA) type questions carrying **2** marks each.
   - In **Section C** – question numbers **26 to 31** are Short Answer Questions (SA) type questions carrying **3** marks each.
   - In **Section D** – question numbers **32 to 35** are Long Answer Questions (LA) type questions carrying **5** marks each.
   - In **Section E** – question numbers **36 to 38** are 3 source-based/case-based units of assessment carrying 4 marks each with sub-parts.
   - There is no overall choice. However, an internal choice has been provided in some Sections.

(SECTION – A)

1. Which one of the following is not a polynomial?

(A) $x^2+\frac{5}{3}x+2$ **(B)** $3x^3+x\left(x+\frac{1}{x}\right)$

(C) $\sqrt{x}\left(\sqrt{x}+\frac{1}{\sqrt{x}}\right)+3$ **(D)** $\sqrt{x}+\frac{1}{\sqrt{x}}+\frac{1}{x}$

2. Side of an equilateral triangle is $2x$. Find the area of triangle.

(A) $\sqrt{3}x^2$ **(B)** $\frac{\sqrt{3}}{2}x^2$ **(C)** $\frac{\sqrt{3}}{4}x^2$ **(D)** $2\sqrt{3}x^2$

3. Find the sum of supplement and compliment of 50°.

(A) 180° **(B)** 170° **(C)** 160° **(D)** 150°

4. Point of intersection of x-axis and y-axis is known as _____.

(A) Abscissa **(B)** Ordinate **(C)** Origin **(D)** Coordinates

5. Which of the following is a factor of $7x^2+8x+1$?

(A) $(7x+1)$ **(B)** $x+7$ **(C)** $(7x+2)$ **(D)** $7x-1$

6. $0.\overline{12}$ in the form of $\frac{p}{q}$.

(A) $\frac{1}{11}$ **(B)** $\frac{5}{33}$ **(C)** $\frac{4}{33}$ **(D)** $\frac{2}{11}$

7. Find the distance between (–7, 3) from *y*-axis.

(A) 7 unit **(B)** –7 unit **(C)** 3 unit **(D)** –3 unit

8. $\left(\left(\frac{1}{a}+\frac{1}{b}\right)^{-1}\right)^{-1}(a+b)^{-1}$ equals:

(A) $a^{-1}+b^{-1}$ **(B)** $a+b$ **(C)** ab **(D)** $a^{-1}b^{-1}$

9. Which of the following needs proof?

(A) All right angle are equal.

(B) Equals of same thing are equals.

(C) A terminated line can be produce indefinitely on both sides.

(D) Sum of all angles of a triangle is 180°.

10. In a ΔPQR, S is mid-point of PR such that $QS=\frac{1}{2}PR$. Then, $2\angle PQR$ is equal to:

(A) 90° **(B)** 45° **(C)** 60° **(D)** 180°

11. In ΔABC & ΔPQR, $\angle A=\angle Q$, $\angle C=\angle R$ & $AC = QR$. Which of the following is true?

(A) $\Delta ABC\cong\Delta PQR$ **(B)** $\Delta ABC\cong\Delta QRP$

(C) $\Delta ABC\cong\Delta PRQ$ **(D)** $\Delta ABC\cong\Delta QPR$

12. In ΔABC, $AB=BC=5cm$ and $CA=6cm$. Find the area of ΔABC.

(A) $6cm^2$ **(B)** $12cm^2$ **(C)** $6\sqrt{2}cm^2$ **(D)** $12\sqrt{2}cm^2$

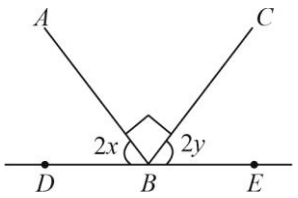
13. Find the value of *x* if $27^x=81^{1/5}$.

(A) $\frac{1}{5}$ **(B)** $1\frac{2}{3}$ **(C)** $\frac{4}{15}$ **(D)** $\frac{2}{5}$

14. Which of the following is solution of $x+2y=3$.

(A) (–1, –1) **(B)** $\left(2,\frac{1}{2}\right)$ **(C)** (3, 1) **(D)** (2, 1)

15. In the given figure, $\angle ABD = 2x$, $\angle CBE = 2y$, $AB \perp BC$ and DBE is a line. Find the value of $x + y$.



(A) 90° **(B)** 45°

(C) 60° **(D)** 40°

16. Which of the following group of sides are of right angled triangle.

(A) 9, 12, 15 **(B)** 12, 4, 13 **(C)** 5, 6, 7 **(D)** 2, 3, 4

17. Find the remainder if $3x^2 + 5x + 5$ is divided by $x + 2$.

(A) 0 **(B)** 2 **(C)** 7 **(D)** 6

18. Equals of same things are _____.

(A) Not equal **(B)** Are reciprocal of each other

(C) Equal **(D)** Additive inverse of each other

Direction: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option:

(A) Both A and R are true and R is the correct explanation for A

(B) Both A and R are true but R is not the correct explanation for A

(C) A is true but R is false

(D) A is false but R is true

19. **Assertion (A) :** $1.\overline{12}$ is a rational number.

Reason (R) : A non-terminating recuring decimal number can be converted into $\frac{p}{q}$ form.

20. **Assertion (A) :** $x - 1$ is factor $x^2 - 5x + 6$.

Reason (R) : $ax + b$ is factor of a polynomial $p(x)$ if $p\left(\frac{-b}{a}\right) = 0$.

(SECTION – B)

21. What is the difference between axioms, postulates and theorem?

22. A linear equation is given by $2x + 3y = 5$. Answer the following question

(i) Wheat is the number of solutions for given equation.

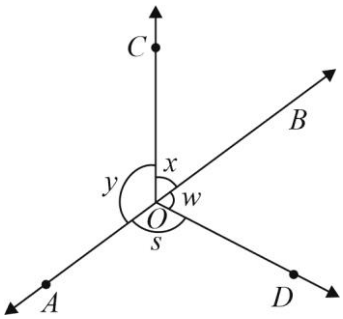
(ii) Find the value of y if $x = 2$.

23. Simplify: $\frac{9^{\frac{1}{3}} \cdot 27^{\frac{1}{2}}}{3^{\frac{1}{6}} \cdot 3^{\frac{1}{3}}}$

OR

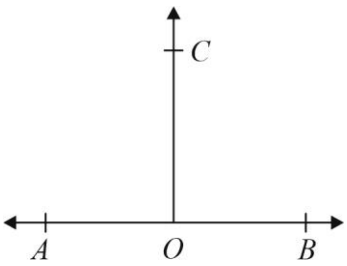
Simplify: $\sqrt[4]{81} - 8\sqrt[3]{27} + 15\sqrt[5]{32} + \sqrt{225}$

24. If $x+y=s+w$, prove that *AOB* is a straight line.

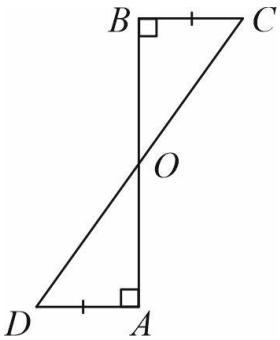


OR

In the figure, if a ray *OC* stands on line *AB* such that $\angle AOC = \angle COB$, then show that $\angle AOC = 90°$.

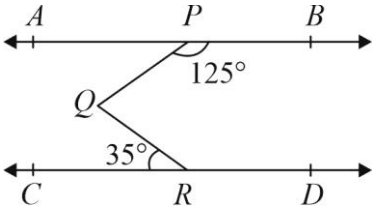


25. In the figure, *AD* and *BC* are equal and perpendiculars to the same line segment *AB*. Show that *CD* bisects *AB*.



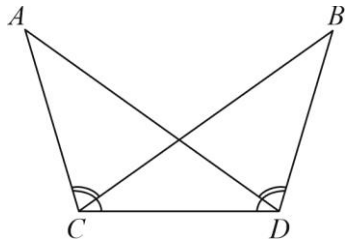
(SECTION – C)

26. In the figure, if *AB* || *CD*, then find $\angle PQR$.



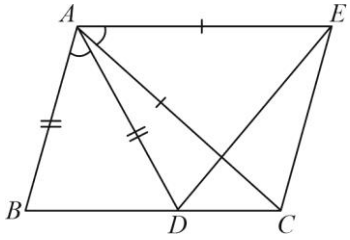
27. The perimeter of an isosceles triangle is 32*cm*. The ratio of one of the equal sides to its base is 3 : 2. Find the area of the triangle.

28. In the figure, $\angle BCD = \angle ADC$ and $\angle ACB = \angle BDA$. Prove that $AD = BC$ and $\angle A = \angle B$.

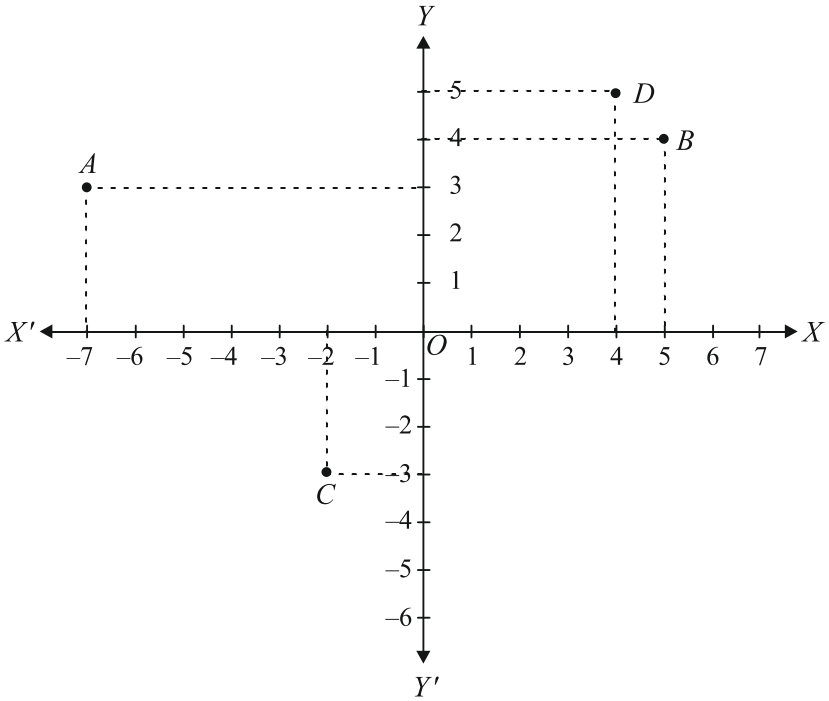


OR

In the figure, $AC = AE$, $AB = AD$ and $\angle BAD = \angle EAC$. Show that $BC = DE$.



29. See the figure and write the following:



(i) Co-ordinates of point *A*

(ii) Abscissa of point D

(iii) The point identified by the co-ordinate (5, 4)

30. The polynomials $p(x)=ax^3+4x^2+3x-4$ and $q(x)=x^3-4x+a$ leave the same remainder when divided by $x-3$. Find the remainder when $p(x)$ is divided by $(x-2)$.

OR

If $x+y+z=9$, then find the value of $(3-x)^3+(3-y)^3+(3-z)^3-3(3-x)(3-y)(3-z)$.

31. If $x=\dfrac{\sqrt{3}-1}{\sqrt{3}+1}$ and $y=\dfrac{2+\sqrt{3}}{2-\sqrt{3}}$, then find the value of x^4+y^2.

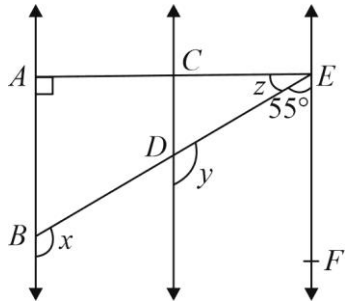
(SECTION – D)

32. Simplify: $\dfrac{1}{2+\sqrt{5}}+\dfrac{1}{\sqrt{5}+\sqrt{6}}+\dfrac{1}{\sqrt{6}+\sqrt{7}}+\dfrac{1}{\sqrt{7}+\sqrt{8}}+\dfrac{1}{\sqrt{8}+\sqrt{9}}$

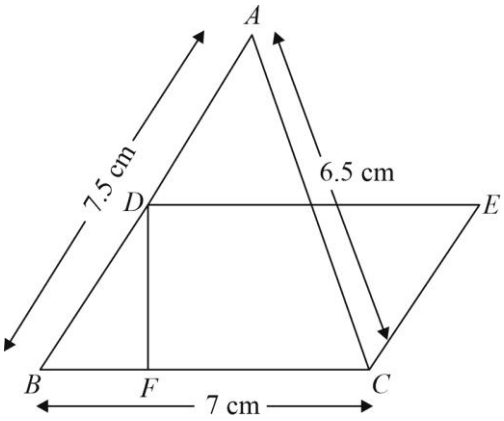
OR

Simplify: $\dfrac{\sqrt{6}}{\sqrt{2}+\sqrt{3}}+\dfrac{3\sqrt{2}}{\sqrt{6}+\sqrt{3}}-\dfrac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}}$

33. In the figure, $AB \| CD$ and $CD \| EF$. Also $EA \perp AB$. If $\angle BEF = 55°$, find the values of x, y and z.



34. In the given figure, ΔABC has sides $AB = 7.5\,cm$, $AC = 6.5\,cm$ and $BC = 7\,cm$. On base BC a parallelogram $DBCE$ of same area as that of ΔABC is constructed. Find the height DF of the parallelogram.



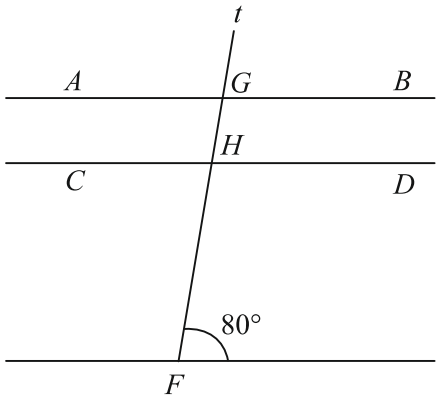
35. Simplify by factorization method: $\dfrac{9-2\sqrt{3}x-x^2}{3-x^2}$

OR

(i) Factorise: a^8-b^8 **(ii)** Factorise: $27a^3-1$

(SECTION – E)

36. An electric pole was titled due to heavy winds by an angle of 80°. Now despite the tilt, the electric wire lines remained parallel to each other and the ground. Now, using the given information, answer the following questions.



(i) Find the measure of angle DHF.

(A) 80° **(B)** 100° **(C)** 180° **(D)** 50°

(ii) Find the measure of angle GHD.

(A) 80° **(B)** 100° **(C)** 180° **(D)** 50°

(iii) Find the measure of angle AGF.

(A) 80° **(B)** 100° **(C)** 180° **(D)** 50°

(iv) Find the measure of angle CHD.

(A) 80° **(B)** 100° **(C)** 180° **(D)** 50°

37. Ankur and Ranjan start a new business together. The amount invested by both partners together is given by the polynomial $p(x)=4x^2+12x+5$, which is the product of their individual shares.

(i) Coefficient of x^2 in the given polynomial is:

(A) 2 **(B)** 3 **(C)** 4 **(D)** 12

(ii) Total amount invested by both, if $x=1000$ is:

(A) 301506 **(B)** 370561 **(C)** 4012005 **(D)** 490621

(iii) The shares of Ankur and Ranjan invested individually are:

(A) $(2x+1),(2x+5)$ **(B)** $(2x+3),(x+1)$

(C) $(x+1),(x+3)$ **(D)** None of these

(iv) What is the name of the polynomial which represents the amount that both have invested?

(A) Cubic **(B)** Quadratic

(C) Biquadratic **(D)** Linear

38. Triangles are used to make bridges because a triangle is an unreformable shape, as considered in the civil engineering field, it can hold the most force when applied to it, compared to quadrilaterals and arches. Isosceles triangles were used to construct a bridge in which the base (unequal side) of an isosceles triangle is 4 m and its perimeter is 20 m.

(i) What is the length of equal sides?

(A) 2 *m* **(B)** 3 *m* **(C)** 8 *m* **(D)** 10 *m*

(ii) What is the Heron's formula for a triangle?

(A) $\sqrt{s(s+a)(s-b)(s-c)}$ **(B)** $\sqrt{s(s+a)(s+b)(s+c)}$

(C) $\sqrt{s(s-a)(s-b)(s-c)}$ **(D)** $\sqrt{s(s.a)(s.b)(s.c)}$

(iii) What is the semi perimeter of the given triangle?

(A) 30*m* **(B)** 40*m* **(C)** 10*m* **(D)** 50*m*

(iv) What is the area of the given triangle?

(A) $4\sqrt{15}\,m^2$ **(B)** $4m^2$ **(C)** $\sqrt{15}m^2$ **(D)** $20\,m^2$