

Time: 3hrs.

M.M. 80

General Instructions:

1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.

Section-A

1. Every rational number is
 - a) a natural number
 - b) an integer
 - c) a real number
 - d) a whole number
2. $(9)^{1/3} \times (3)^{1/3}$ is equal to
 - a) $\frac{1}{3}$
 - b) 27
 - c) 3
 - d) none of these
3. The value of $\frac{16^{3/4}}{16^{1/4}}$ is
 - a) 16
 - b) 4
 - c) 0
 - d) none of these
4. Coefficient of x^2 in $\sqrt{2}x - 1$
 - a) 1
 - b) 0
 - c) -1
 - d) none of these
5. The value of $p(r) = 6r^2 + 7r - 3$ when $r = -1$
 - a) -4
 - b) 4
 - c) -13
 - d) 10
6. A cubic polynomial has
 - a) 2 zeros
 - b) 1 zero
 - c) 3 zeros
 - d) 4 zeros
7. Find the value of a , if $x - a$ is a factor of $x^3 - ax^2 + 2x + a - 1$
 - a) 3
 - b) $-\frac{1}{3}$
 - c) $\frac{1}{3}$
 - d) 0
8. Any point on the line $y = x$ is of the form
 - a) (a, a)
 - b) $(0, a)$
 - c) $(a, 0)$
 - d) $(a, -a)$

9. Any point on the line y -axis is of the form

- a) $(x, 0)$ b) $(0, y)$ c) (x, x) d) (x, y)

10. Equation represent X axis is

- a) $y = 0$ b) $x = 0$ c) $x = -y$ d) $x = y$

11. Zero of the polynomial $p(x) = x + 2$, is

- a) 2 b) -2 c) $\frac{1}{2}$ d) $-\frac{1}{2}$

12. The point $(-3, 5)$ lies in the

- a) first quadrant b) second quadrant c) third quadrant d) fourth quadrant

13. If the coordinates of two points $P(-2, 3)$ and $Q(-3, 5)$ then (abscissa of P) - (abscissa of Q)

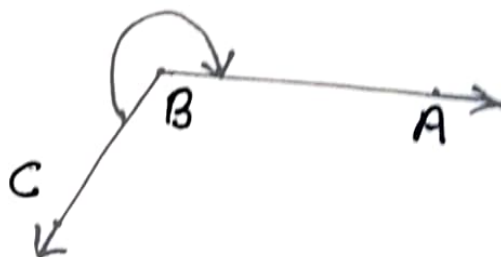
- a) -2 b) -5 c) 1 d) -1

14. The value of $P(2)$ of $p(t) = 2 + t + t^2 - t^3$

- a) 0 b) -4 c) 2 d) 4

15. Angle ABC marked in figure is a/an

- a) acute angle
b) obtuse angle
c) reflex angle
d) none of these

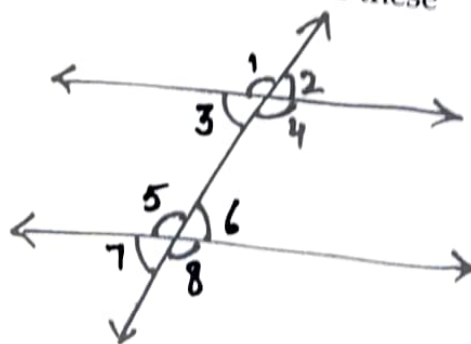


16. If the difference between two supplementary angles is 40° , then the angles are

- a) $65^\circ, 125^\circ$ b) $210^\circ, 150^\circ$ c) $70^\circ, 110^\circ$ d) none of these

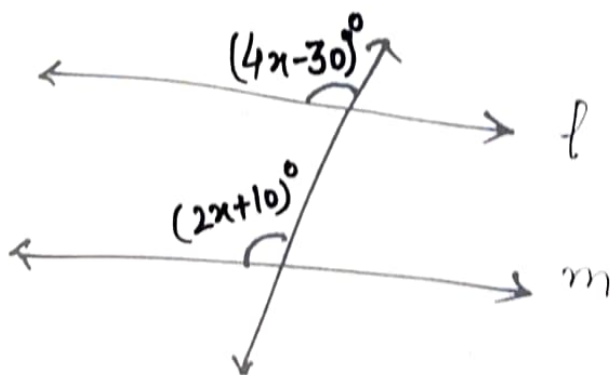
17. In figure $\angle 3$ and $\angle 6$ are known as

- a) corresponding angles
b) cointerior angles
c) vertically opposite angles
d) alternate interior angles



18. The value of x if $l \parallel m$

- a) 30°
b) 40°
c) 20°
d) 50°



Assertion - Reason (for question 19 & 20)

Read the given statement choose the correct option:

- a) Both Assertion and Reason are true and reason is correct explanation of assertion.
- b) Both Assertion and Reason are true but reason is not correct explanation of assertion.
- c) Assertion is true but Reason is false.
- d) Assertion is false but reason is true.

19. Assertion : $(5 + \sqrt{2})(5 - \sqrt{2})$ is a rational number

Reason : Product of two irrational numbers may be rational or irrational

20. Assertion : If the point $(-2, 2)$ lies on the line $ax + 4y = 2$, then $a = 3$

Reason : The point $(1, 2)$ lies on the line $3x + 2y + 7 = 0$

Section - B

21. Locate $\sqrt{5}$ on the number line.

22. Express $0.2353535 \dots$ can be expressed in the form of p/q where p/q are integers and $q \neq 0$

23. Expand $(4a - 2b - 3c)^2$

24. a) Write an equation in two variable, $2x = 3$

b) Check whether $(4, 0)$ is the solution of the equation $x - 2y = 4$

25. In the given figure if $x + y = w + z$,

then prove that AOB is a line

Section - C

26. Evaluate $(999)^3$ by using suitable identity

27. Verify $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$

28. Factorise $8x^3 + 27y^3 + 36x^2y + 54xy^2$

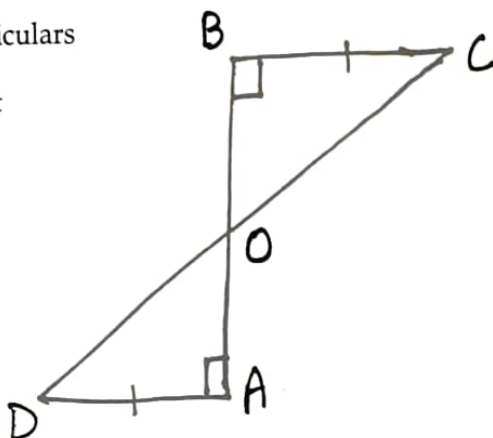
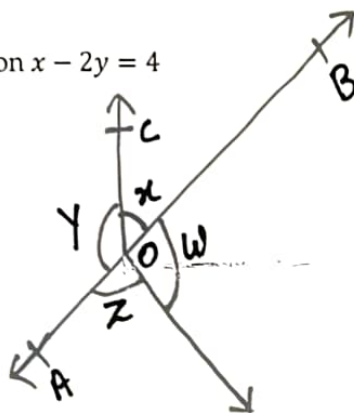
29. Evaluate 104×96 by using suitable identity.

30. Prove that angles opposite to equal side of a triangle are equal.

31. AD and BC are equal perpendiculars

to a line segment AB. Show that

CD bisects AB



Section - D

32. Find the value of a and b if $\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}} = a - b\sqrt{6}$

33. Find the value of $\frac{4}{(216)^{-2/3}} + \frac{1}{(256)^{-3/4}} + \frac{2}{(243)^{-1/5}}$

34. By using factor theorem, determine whether $g(x)$ is a factor of $p(x)$

a) $P(x) = 2x^3 + x^2 - 2x - 1, g(x) = x + 1$

b) Factorise $6x^2 + 5x - 6$

35. In a right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to point D such that $DM = CM$.

Point D is joined to point B

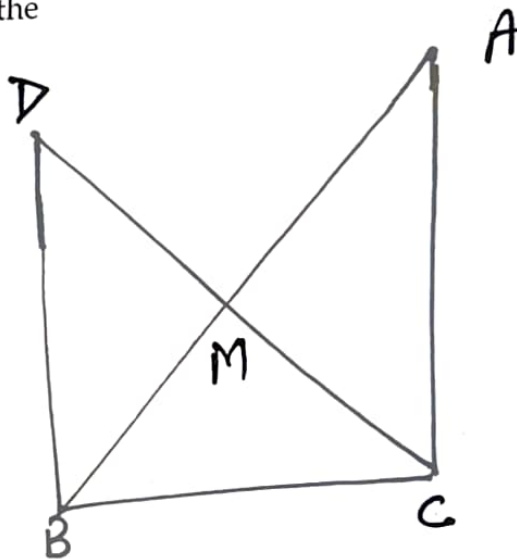
Show that

i) $\Delta AMC \cong \Delta BMD$

ii) $\angle DBC$ is a right angle

iii) $\Delta DBC \cong \Delta ACB$

iv) $CM = \frac{1}{2}AB$



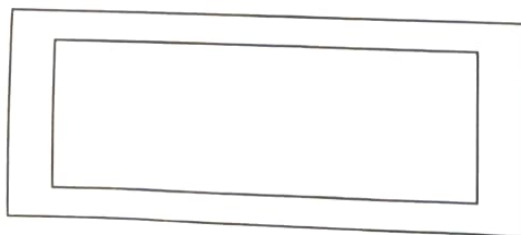
Section - E

Case Study :

36. Read and answer the following questions:

Sunita made a scenery for gift so that she can gift it to her best friend on her birthday. The length of a photoframe is thrice its breadth.

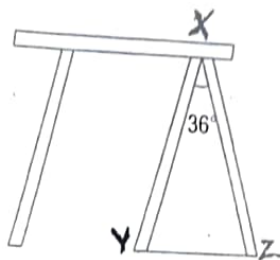
The length and breadth of the photoframe are y and x respectively.



- Write the linear equation which satisfies the above information.
- How many solutions of a linear equation in two variables?
- If the value of x is 5, then find the value of y.

Read and answer the following questions:

An aluminium ladder manufacturing company manufactures foldable step ladder shown in figure. The length XY and XZ are each equal to 110 cm and the vertical angle is 36° .



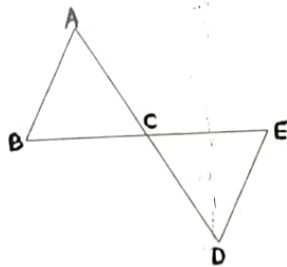
a) Which type of triangle is $\triangle XYZ$?

b) In two triangles ABC and DEF , $\angle A = \angle D$, $AB = DE$ and $AC = DF$, name the criterion for congruence of triangles?

c) If $\angle YXZ$ is 60° then find the length of YZ .

38. Read and answer the following questions:

Sonika loves triangular objects. She wants to decorate the wall of her room with some triangular hangings. When she searched for it she found a number of beautiful options for her room.



a) The angles of triangle ABC are in the ratio $3 : 4 : 5$. What is the measure of the largest angle?

b) If $AB \parallel DE$, find the measure of $\angle CED$

c) If $\angle ABC = 50^\circ$ and $\angle DCE = 55^\circ$ then find $\angle BAC$

BUDHA DAL PUBLIC SCHOOL PATIALA
FIRST TERM EXAMINATION (12 September 2024)

Class - IX

Paper-Mathematics (Set-A)

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Section-A

1. Decimal representation of a rational number cannot be
 - a) terminating
 - b) non-terminating non repeating
 - c) non terminating
 - d) non-terminating repeating
2. The value of $4\sqrt{15} \div 2\sqrt{3}$ is
 - a) 10
 - b) $\sqrt{2}$
 - c) $2\sqrt{5}$
 - d) $5\sqrt{2}$
3. Rationalising factor for the denominator of the expression $\frac{1}{\sqrt{3}+\sqrt{2}}$ is
 - a) $\sqrt{3} + \sqrt{2}$
 - b) $\sqrt{3} - \sqrt{2}$
 - c) $\frac{\sqrt{3}-\sqrt{2}}{5}$
 - d) $\frac{\sqrt{3}-\sqrt{2}}{4}$
4. Coefficient of x^2 in $2 - x^2 + x^3$
 - a) 0
 - b) 1
 - c) -1
 - d) 2
5. Zero of the linear polynomial $p(x) = 3x + 2$, is
 - a) $\frac{2}{3}$
 - b) $-\frac{3}{2}$
 - c) $-\frac{2}{3}$
 - d) $\frac{1}{3}$
6. For what value of k , $(x + 1)$ is a factor of $(x) = kx^2 - x - 4$?
 - a) 0
 - b) 1
 - c) 2
 - d) 3
7. Number of zeroes of quadratic polynomial are
 - a) 1
 - b) 2
 - c) 3
 - d) 4
8. If $(2, 0)$ is a solution of the linear equation $2x + 3y = k$, then value of k is
 - a) 4
 - b) 6
 - c) 5
 - d) 2

9. Any point on x - axis is of the form
 a) (x, y) b) $(0, y)$ c) $(x, 0)$ d) (x, x)
10. Equation representing y axis is
 a) $x = 0$ b) $y = 0$ c) $x = y$ d) $x = -y$
11. Degree of the zero polynomial is
 a) 0 b) 1 c) any natural number d) not defined
12. Signs of the abscissa and ordinate of a point in the second quadrant are
 a) $(+, +)$ b) $(-, -)$ c) $(-, +)$ d) $(+, -)$
13. The point which lies on the line $y = -3x$ is
 a) $(2, -7)$ b) $(3, -6)$ c) $(3, 9)$ d) $(3, -9)$
14. The value of $P(0)$ of $p(t) = 2 + t + t^2 - t^3$
 a) 0 b) 1 c) 2 d) -2
15. The angle which exceeds its complement by 30° is
 a) 150° b) 120° c) 60° d) 30°

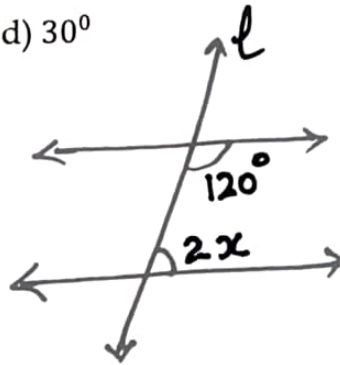
16. The value of x if $m \parallel n$

a) 60°

b) 70°

c) 30°

d) none of these



17. The ratio between two complementary angles is $2 : 3$ then angles are
 a) $144^\circ, 216^\circ$ b) $120^\circ, 240^\circ$ c) $36^\circ, 54^\circ$ d) $30^\circ, 60^\circ$

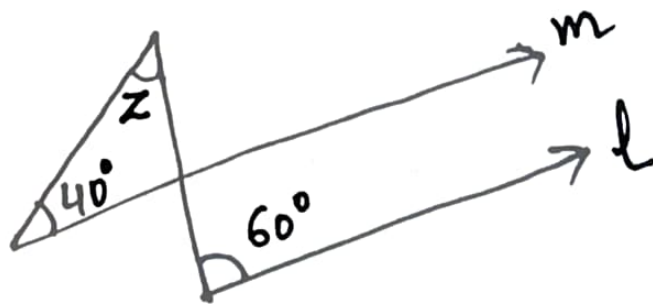
18. In figure if $l \parallel m$, then $\angle Z$ is

a) 10°

b) 20°

c) 30°

d) 40°



Assertion - Reason (for question 19 & 20)

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19. Assertion : If the point $(-2, 2)$ lies on the line $ax + 4y = 2$, then $a = 3$

Reason : The point $(1, 2)$ lies on the line $3x + 2y + 7 = 0$

20. Assertion : $(5 + \sqrt{2})(5 - \sqrt{2})$ is a rational number

Reason : Product of two irrational numbers may be rational or irrational

Section - B

21. Locate $\sqrt{2}$ on the number line.

22. Express $1.27\ 27\ 27\ \dots$ in the form of p/q where p and q are integers.

23. Factorise $(4x^2 + y^2 + z^2 - 4xy - 2yz + 4xz)$

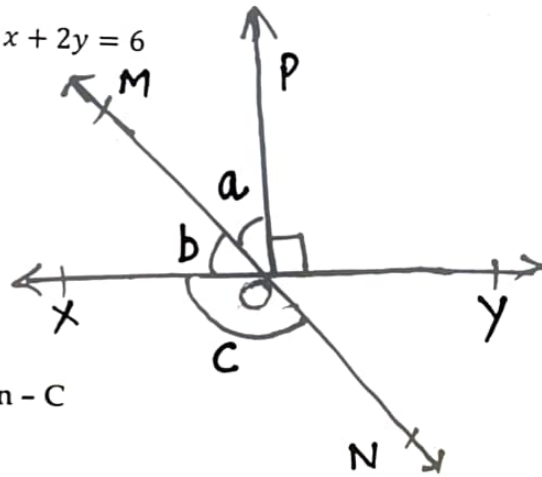
24. Find four different solution of the equation $x + 2y = 6$

25. In the given figure lines

XY and MN intersect

at O . If $\angle POY = 90^\circ$ and $a : b = 2 : 3$

find C .



Section - C

26. Evaluate $(103)^3$ by using suitable identity

27. Factorise $27y^3 + 125z^3$

28. Factorise $8a^3 - b^3 - 12a^2b + 6ab^2$

29. Evaluate 95×96 by using suitable identity.

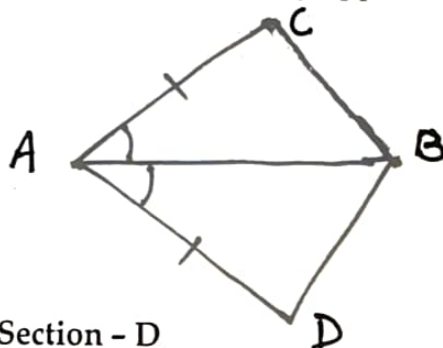
30. If two lines are intersecting each other then prove that vertically opposite angles are equal.

31. In quadrilateral $ABCD$, $AC = AD$

and AB bisects $\angle A$. Show that

$\triangle ABC \cong \triangle ABD$. What can you say

about BC and BD ?



Section - D

32. Find the value of a and b if $\frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} - \sqrt{3}} = a + b\sqrt{15}$

33. Find the value of $\frac{4}{(216)^{-2/3}} + \frac{1}{(256)^{-3/4}} + \frac{2}{(243)^{-1/5}}$

34. a) Find $P(1)$, $P(-1)$ and $P(2)$ if $P(x) = 2 + x + 2x^2 - x^3$

b) Factorise $12y^2 - 7y + 1$

35. In a right triangle ABC , right angled at C , M is the

mid-point of hypotenuse AB . C is joined to M

and produced to a point D such that $DM = CM$.

Point D is joined to point B

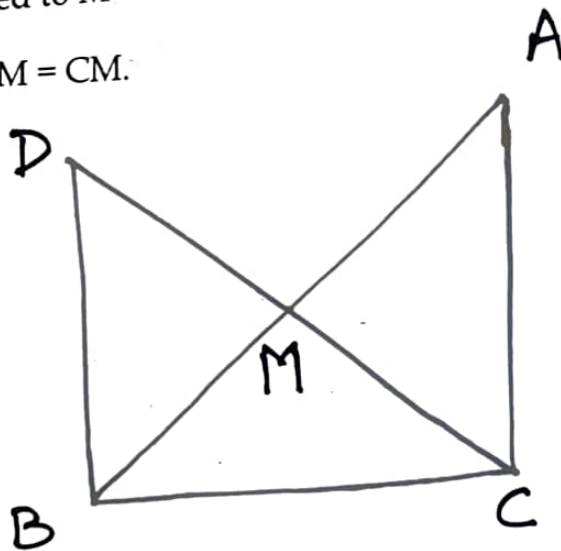
Show that

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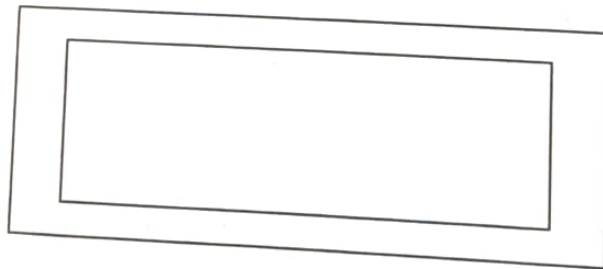
Section - E

Case Study :

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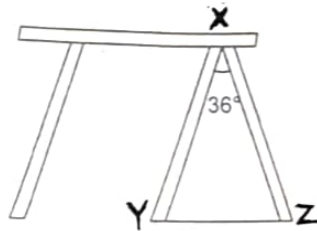
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- Write the linear equation which satisfies the above information.
- How many solutions of a linear equation in two variables?
- If the value of y is 4, then find the value of x

37. Read and answer the following questions:

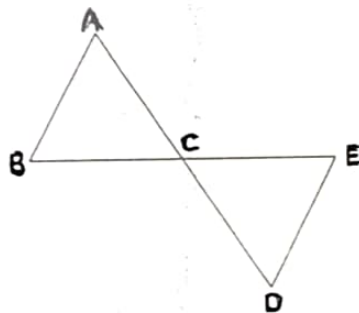
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- Which type of triangle is ΔYXZ ?
- In two triangles ABC and DEF , $\angle A = \angle D$, $AB = DE$ and $AC = DF$, name the criterion for congruence of triangles?
- What is the ratio of $\angle YXZ$ to $\angle XZY$?

38. Read and answer the following questions:

Ishita loves triangular objects. She wants to decorate the wall of her room with some triangular hangings. When she searched for it she found a number of beautiful options for her room.



- The angles of triangle ABC are in the ratio $3 : 4 : 5$. What is the measure of the smallest angle?
- If $AB \parallel DE$, find the measure of $\angle CED$
- If $\angle ABC = 60^\circ$ and $\angle DCE = 40^\circ$ then find $\angle BAC$