

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

Class - IX
Paper-Mathematics (Set-A)

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. 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 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

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 $p(t) = 2 + t + t^2 - t^3$

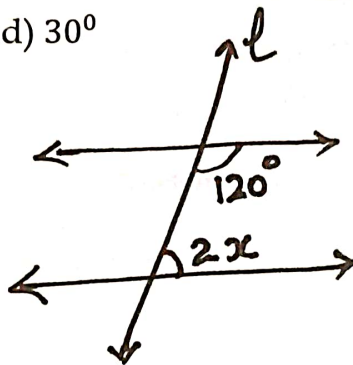
- a) 0 b) 1 c) 2 d) -2

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

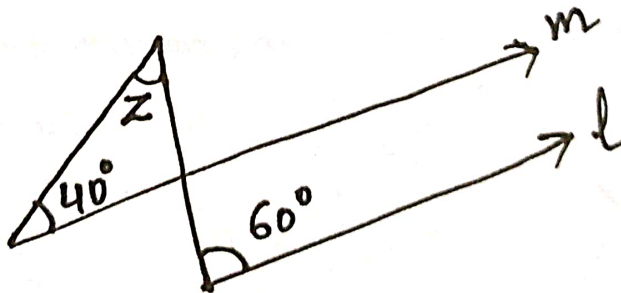


17. The ratio between two complementary angles is $2 : 3$ then angles are

- 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)

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.

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 $3x + 2y + 7 = 0$

10. 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 $(4x^2 + y^2 + z^2 - 4xy - 2yz + 4xz)$

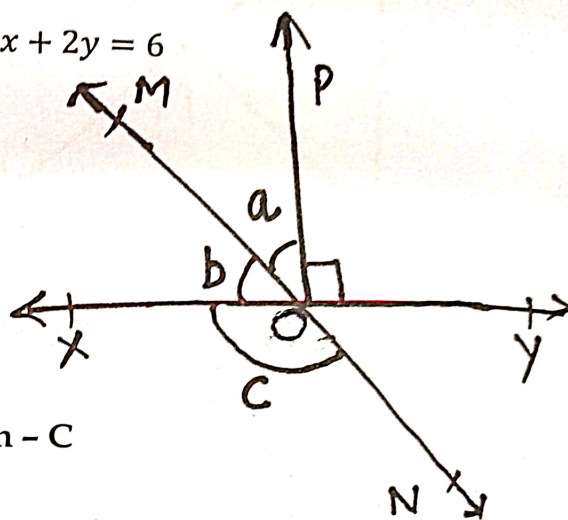
24. Find four different solution of the equation $x + 2y = 6$

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.

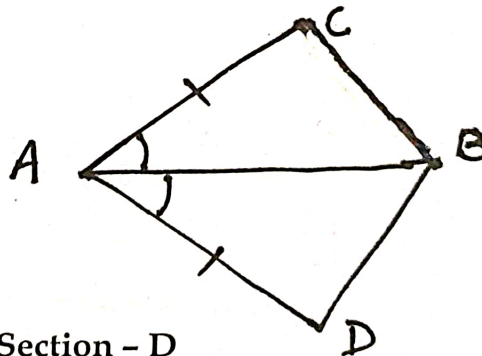
30. If two lines are intersecting each other then prove that vertically opposite angles are equal.

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 $\frac{4}{(216)^{-2/3}} + \frac{1}{(256)^{-3/4}} + \frac{2}{(243)^{-1/5}}$

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 $3x + 2y + 7 = 0$

10. 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 $(4x^2 + y^2 + z^2 - 4xy - 2yz + 4xz)$

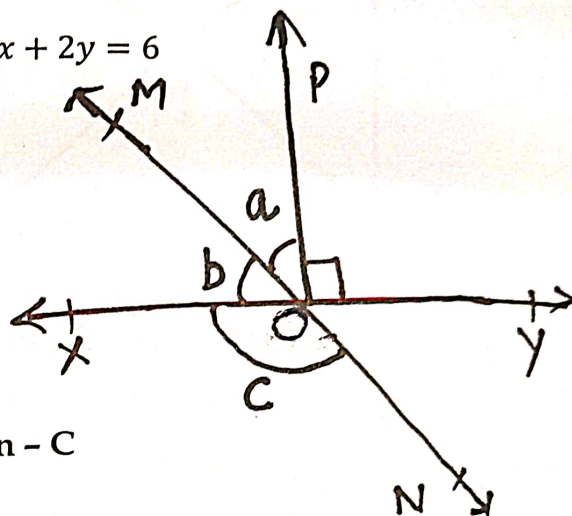
24. Find four different solution of the equation $x + 2y = 6$

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.

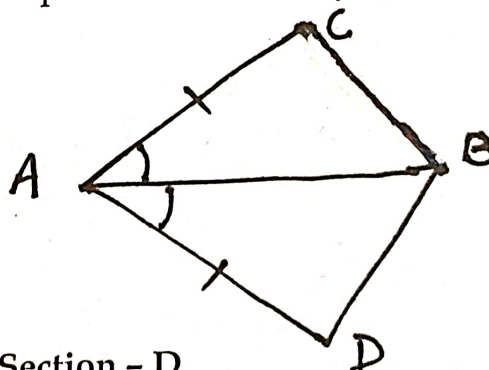
30. If two lines are intersecting each other then prove that vertically opposite angles are equal.

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 $\frac{4}{(216)^{-2/3}} + \frac{1}{(256)^{-3/4}} + \frac{2}{(243)^{-1/5}}$

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

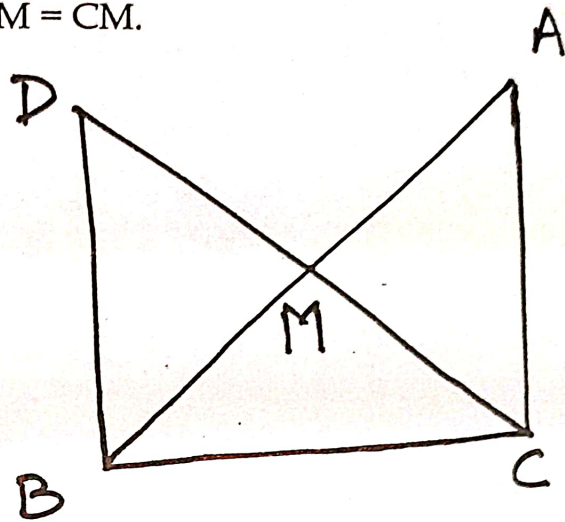
Show that

i) $\triangle AMC \cong \triangle BMD$

ii) $\angle DBC$ is a right angle

iii) $\triangle DBC \cong \triangle ACB$

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



Section - E

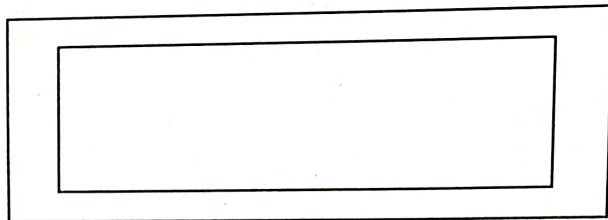
Case Study :

36. Read and answer the following questions:

Kavita made a scenery for gift so that she can gift it to her best friend on her birthday.

length of a photoframe is thrice its breadth.

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



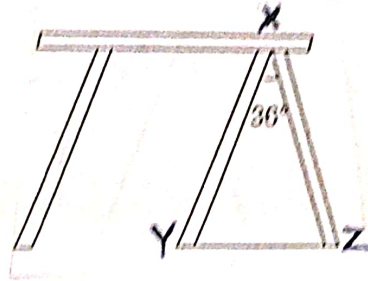
a) Write the linear equation which satisfies the above information.

b) How many solutions of a linear equation in two variables?

c) If the value of y is 4, then find the value of x

Read and answer the following questions:

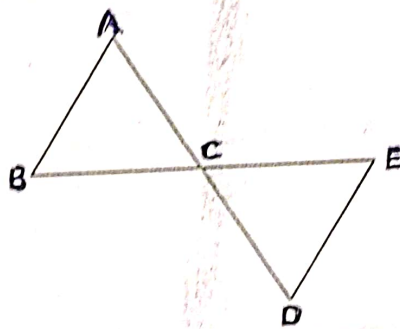
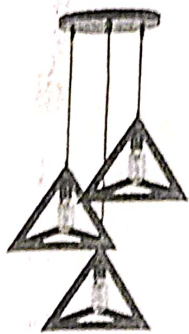
An aluminium ladder manufacturing company manufactures foldable step ladder shown in figure. The length XY and XZ are each equal to 110 cm and the vertical angle is 36° .



- Which type of triangle is $\triangle YXZ$?
- 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 $\angle BAC$