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DAV Public school HP-Zone C
Annual Examination Feb. – Mar. 2025
Class - IX
Subject- Mathematics

Time Allowed: 3 Hrs **Maximum Marks: 80**

General Instructions:

1. This Question Paper has 5 Sections A-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.
7. All Questions are compulsory. However, an internal choice in 2 questions of 5 marks, 2 questions of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
8. Draw neat figures wherever required. Take π =22/7 wherever required if not stated otherwise.

SECTION A

1. The remainder when x^{11} - 1 is divided by x + 1 is
(A) 10 (B) 11 (C) 0 (D) -2

2. Rational number $-\frac{19}{2}$ lies between consecutive integers
(A) -9 and -10 (B) -7 and -8 (C) -6 and -7 (D) -1 and -2

3. $\sqrt{12} \times \sqrt{15}$ = **[1]**
(A) $\sqrt{5}$ (B) $5\sqrt{6}$ (C) $6\sqrt{5}$ (D) $\sqrt{6}$

4 .If $(3x + \frac{1}{2})(3x - \frac{1}{2}) = 9x^2 - p$, then p =

(A) $\frac{1}{4}$ (B) $-\frac{1}{4}$ (C) 0 (D) $\frac{1}{2}$

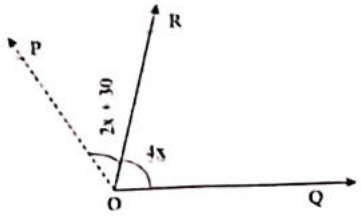
5. Solution of the equation 3x - y = 3 is
A) (3 , -3) (B) x = (3,6) (C) (3,0) (D) (0,-3)

6. If (2k - 1, k) is a solution of the equation 10x - 9y = 12 , then k = _____

(A) 3 (B) 4 (C)2 (D) 1

7. In triangles ABC and PQR, AB = AC, ∠ C = ∠P and∠ B =∠ Q. The two triangles are
(A) isosceles but not congruent (B) isosceles and congruent
(C) congruent but not isosceles (D) neither congruent nor isosceles

8.In the given figure, the value of x which makes POQ a straight line is:



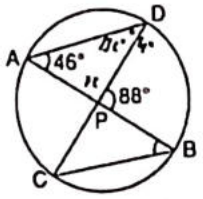
(A) 40° (B) 30° (C) 35° (D) 25°

9 . The point (0, -4) lies
(A) on the negative direction of y-axis (B) in quadrant III
(C) in quadrant IV (D) on the negative direction of x-axis

10.The factorized form of $y^2 + 5y - 36$ is
(A) (y + 9)(y + 4) (B) (y - 9)(y + 4) (C) (y + 9)(y - 4) (D) (y - 9)(y - 4)

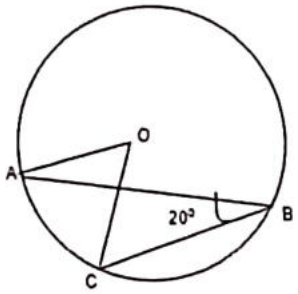
11. A histogram is a pictorial representation of the grouped data in which **class intervals** and **frequency** are **respectively** taken along
(A) horizontal axis only (B) horizontal axis and vertical axis
(C) vertical axis and horizontal axis (D) vertical axis only

12. In the given figure, chords AB and CD intersect at P. If $\angle DPB = 88^0$ and $\angle DAP = 46^0$ then the measure of $\angle ABC$ is



(A) 42^0 (B) 48^0 (C) 46^0 (D) 44^0

13. In the figure, O is the centre of the circle. If $\angle ABC = 20^0$, then $\angle AOC$ is equal to :



(A) 60° (B) 10° (C) 40° (D) 20°

14 . The height of a cone of diameter 10 cm and slant height 13 cm, is
(A) 13 cm (B) 12 cm(C) 11 cm (D) cm

15 .The side of an equilateral triangle having area equal to $16\sqrt{3}$ m² is

(A) 12 m (B) 16 m (C) 4 m (D) 8 m

16 .The base and hypotenuse of a right triangle are respectively 12 m and 13 m long. Its area is

(A)25 m² (B) 28 m² (C) 30 m² (D) 40 m²

17. The ratio of the total surface area of two spheres having their radii in the ratio 2:5 is

(A) 8 : 125 (B) 2 : 5 (C)) 2 : 25 (D) 4 :25

18. Area of canvas required to make a tent of diameter 14m and slant height 9m is

(A) 189m² (B) 198 cm² (C) 352m² (D) 325m²

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

ASSERTION (A) : Two opposite angles of a parallelogram are $(3x - 5)^0$ and $(2x + 25)^0$ then one of these angles measures 85^0 .

REASON(R) : Opposite angles of a parallelogram are supplementary .

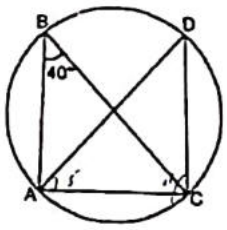
(A)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

(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.

20.ASSERTION(A) : In the figure, ∠ABC = 40°. If ∠DAC= 65°, then ∠DCA =75°.



REASON(R): Angle in a semicircle is a right angle.

(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 but reason (R) is not the correct explanation of assertion (A)

(C) Assertion (A) is true but reason (R) is false.

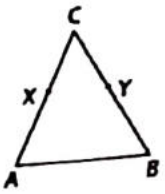
(D) Assertion (A) is false but reason (R) is true.

SECTION B

21. Without finding the actual cubes, find the value of $25^3 - 75^3 + 50^3$.

22. Check whether (4, 5) is solutions of the equation 5x - 4y = 20 **or** not .Find the value of x for y = - 5 in the above equation.

23. In the following triangle if **X** and **Y** are mid points of the sides AC and BC respectively and AX = BY,show that AC = BC using suitable Euclid's axiom(s).



24. Find the area of equilateral triangle whose side is 12 cm using **Heron's formula.**

OR

Calculate the area of the triangle whose sides are 18 cm, 24 cm and 30 cm in length.

25. A Joker's cap is in the form of a right circular cone of base radius 7 cm and height 24 cm. Find the area of the sheet required to make 10 such caps.

OR

A hemispherical tank is made up of an iron sheet 1 cm thick. If the inner radius is 1 m, then find the volume of the iron used to make the tank.

SECTION C

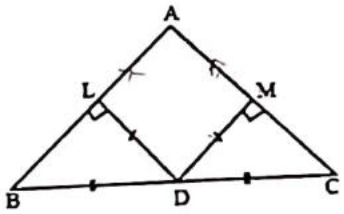
26. Name the quadrants in which the following points lie: (i) A (2, 9) (ii) B (–3, 5) (iii) C(–4, –7) (iv) D(3, –2). Also find the difference between the abscissa of point B and ordinate of point C.

27. Represent $\sqrt{3}$ on the number line .Justify your construction .

28 .(i) Express the linear equation $3x + 2 = 0$ in the form $ax + by + c = 0$ and indicate the values of a, b and c.

(ii) Find a solution of the equation $8x - 6y = 2$.

29. In Δ ABC ,D is the midpoint of BC. If DL $\perp$ AB and DM $\perp$ AC such that DL = DM. prove that AB = AC.

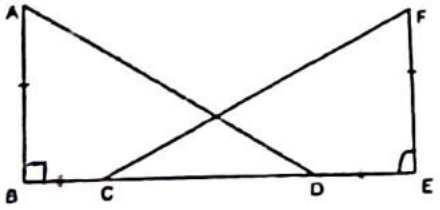


30. Factorise the polynomial $x^3 + 13x^2 + 31x - 45$, given that $x + 9$ is one of its factors.

OR

Evaluate 105^3 by using a suitable identity

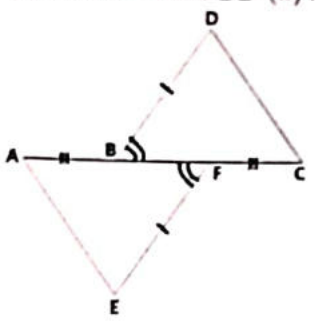
31. In the following figure, AB $\perp$ BE and FE $\perp$ BE. If BC = DE and AB = EF, then prove that (i) $\Delta ABD \cong \Delta FEC$ (ii) AD = CF



OR

In the given figure, AB = FC, EF = BD and ∠AFE = ∠CBD. Then show that

(i) $\triangle AFE \cong \triangle CBD$ (ii) AE ∥ DC



SECTION D

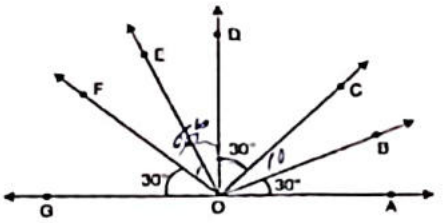
32. If both x – 2 and x – 1 are factors of $x^3 + ax^2 - bx + 10$, find the values of a and b.

OR

Factorise : **(i)** $343a^3 + 125b^3$

(ii) If 2x + 3y = 13 and xy = 6 , find the value of $8x^3 + 27y^3$

33. In the given figure, ∠ AOF and∠ FOG form a linear pair, ∠EOB =∠ FOC = 90° and ∠DOC =∠FOG = ∠AOB = 30°. Find the measures of ∠FOE, ∠COB and ∠DOE.



OR

If two lines intersect, prove that the vertically opposite angles are equal.

34. Draw a histogram for the following data:

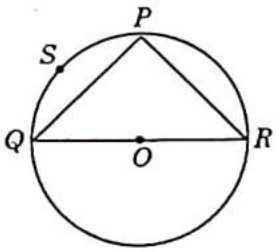
Class interval	600-640	640-680	680-720	720-760	760-800	800-840
Frequency	18	45	153	288	171	63

Using this histogram, draw the frequency polygon on the same graph.

35. Simplify : $\frac{4+\sqrt{5}}{4-\sqrt{5}} + \frac{4-\sqrt{5}}{4+\sqrt{5}}$

SECTION E

36.Read the following text carefully and answer the questions that follow:
Navyam and his mother visited a mall. He observes that three shops are situated at P, Q, R as shown in the figure from where they have to purchase things according to their need. Distance between shop P and Q is 8 m and between shop P and R is 6 m. Considering O as the center of the circle.



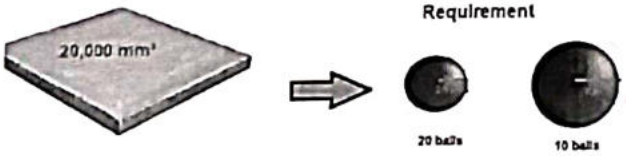
i)Find the Measure of∠ QPR. (1)
ii)Find the radius of the circle. (1)

iii)Find the area of ∆ QSR. (2)

OR

If $\angle SOQ = 48^0$, find ∠SRQ . (2)

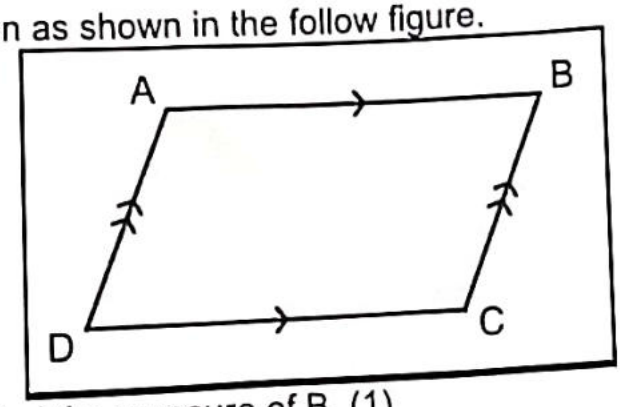
37. Read the following text carefully and answer the questions that follow:
In Agra in a grinding mill, there were installed 5 types of mills. These mills used steel balls of radius 5 mm, 7 mm, 10 mm, 14 mm and 16 mm respectively. All the balls were in the spherical shape.
For repairing purpose mills need 10 balls of 7 mm radius and 20 balls of 3.5 mm radius.
The workshop was having 20000 mm^3 steel.
This 20000 mm^3 steel was melted and 10 balls of 7 mm radius and 20 balls of 3.5 mm radius were made and the remaining steel was stored for future use.



i)What was the volume of one ball of 3.5 mm radius? (1)
ii)What was the surface area of one ball of 3.5 mm radius? (1)
iii)What was the volume of 10 balls of radius 7 mm? (2)
OR
How much steel was kept for future use? (2)

1. **Read the following text carefully and answer the questions that follow:**

CHILD for an inter-school competition as shown in the follow figure.



i).If$\angle$ A = $(4x + 3)^0$ and$\angle$D = $(5x - 3)^0$, then find the measure of B. (1)

ii)If $\angle$B = $(2y)^0$ and $\angle$D = $(3y - 6)^0$, then find the value of y. (1

iii) If$\angle$ A = $(2x - 3)^0$ and$\angle$ C = $(4y + 2)^0$, then find how x and y are related? (2)

OR

If AB = (2y - 3)cm and CD = 5 cm then what is the value of y? (2)