

SESSION ENDING EXAMINATION, 2020-21

CLASS - IX

MATHEMATICS

S

Time - 3 Hours]

[Max. Marks - 80

General Instructions :—

- (i) This question paper contains two parts A and B.
- (ii) Both part A and B have internal choices.

Part-A

- (iii) It consists two sections I and II.
- (iv) Section I has 16 questions of 1 mark each. Internal choices is provided in 5 questions.
- (v) Section II has 4 questions on case study. Each case study has 5 case based sub parts. An examinee is to attempt any 4 out of 5 sub parts.

Part-B

- (vi) Question No. 21 to 26 are very short answer type questions of 2 marks each.
- (vii) Question No. 27 to 33 are short answer type questions of 3 marks each.
- (viii) Questions No. 34 to 36 are long answer type questions of 5 marks each. Internal choices is provided in 2 question of 2 marks, 2 questions of 3 marks and 1 question of 5 marks.

Part-A

Section-1

Section 1 has 16 questions of 1 mark each.

Internal choices is provided in 5 questions.

1. Find the value of p for which $x + p$ is a factor of $x^2 + px + 3$.

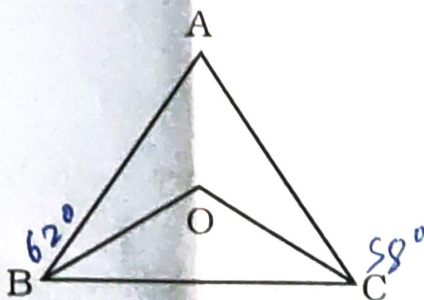
Or

In a class there are p girls and q boys. A student is selected at random. Then find the probability of getting a girl.

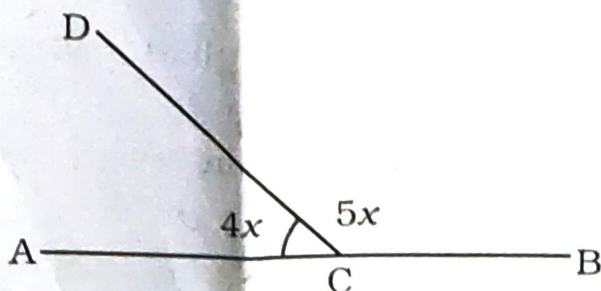
2. A cone has base diameter of 14 cm and slant-height of 25 cm. Find its height.
3. In a triangle ABC, $\angle A + \angle B = 105^\circ$, $\angle B + \angle C = 120^\circ$ then find $\angle B$.
4. Find the value of $4\sqrt{28} + 3\sqrt{7}$.
5. In which quadrant does point $(-2, 6)$ lie?

Or

- If the point $(3, 4)$ lie on the graph of an equation $3y = ax + 7$, find a.
6. Factorise : $7a^3 + 56b^3$.
7. In fig. in $\triangle ABC$ the angle bisector of $\angle B$ and $\angle C$ meet at point O. Find the value of $\angle BOC$.



8. In fig. find the value of x.



9. Show that $x = 2$, $y = 3$ satisfy the linear equation $3x - 4y + 6 = 0$.
10. Express $\frac{2x}{3} + \frac{y}{6} - 5 = 0$ in the form of $ax + by + c = 0$
11. An equilateral triangle of side 9 cm is inscribed in a circle. Find its radius.
12. Find the surface area of a sphere whose volume is 606.375 m^3 .

Or

The volume of a sphere is 38808 cm^3 . Find its radius and hence its surface area.

13. It is given that the probability of winning a game is 0.7. What is the probability of losing the game ?
14. 1 cm^3 of gold is drawn into a wire 0.1 m in diameter. Find the length of the wire.

Or

The T.S.A. of a cube is 1176 cm^2 . Find its volume.

15. Find the measure of an angle which is 24° more than its complements.
16. If $a + b + c = 0$ then find the value of $a^3 + b^3 + c^3$.

OR

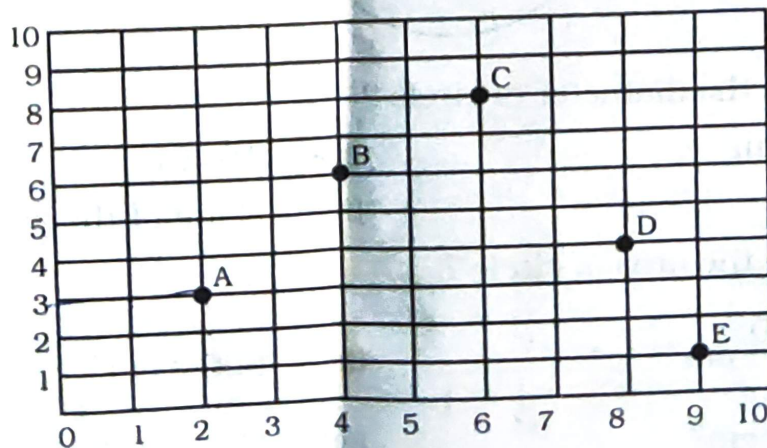
Factorise $3x^3 + 2x^2 + 3x + 2$.

Section-B

Case study based questions are compulsory. Attempt any four sub part of each question. Each sub part carries 1 mark.

17. Case study based-1

In a classroom, 5 friends are seated at points A, B, C, D and E as shown in the fig. Ram and Shyam walk into the class and after observing for few minutes Ram asks Shyam.



- (a) What is the position of A ?

(i) (1, 2)

(iii) (3, 2)

(ii) (2, 3)

(iv) None of these

(b) What is the position of B ?

(i) (4, 6)

(ii) (6, 4)

(iii) (0, 6)

(iv) None of these

(c) What is the position of C ?

(i) (8, 6)

(ii) (6, 8)

(iii) (8, 10)

(iv) (10, 8)

(d) What is the position of D ?

(i) (8, 4)

(ii) (4, 8)

(iii) (4, 5)

(iv) None of these

(e) What is the position of E ?

(i) (1, 9)

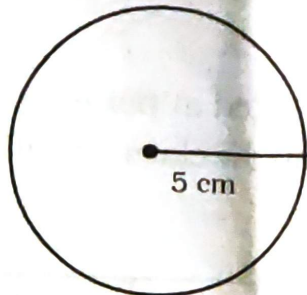
(ii) (9, 1)

(iii) (10, 9)

(iv) None of these

18. Case Study-2

In given fig. a circle whose radius is 5 cm.



(a) What is the diameter of circle ?

(i) 5 cm

(ii) 10 cm

(iii) π

(iv) None of these

(b) What is the area of circle ?

(i) $\frac{550}{7} \text{ cm}^2$

(ii) $550 \pi \text{ cm}^2$

(iii) $7 \pi \text{ cm}^2$

(iv) None of these

(c) What is circumference of circle ?

(i) $\frac{220}{7} \text{ cm}$

(ii) $\frac{7}{220} \text{ cm}$

(iii) 420 cm

(iv) 220 cm

(d) Perimeter of semi circle

(i) $\frac{180}{7}$ cm

(ii) $\frac{7}{180}$ cm

(iii) $\frac{210}{7}$ cm

(iv) None of these

(e) Find the difference between circumference and perimeter of semi circle

(a) π

(ii) $\frac{\pi}{2}$

(c) $\frac{7}{\pi}$

(d) None of these

19. A dice is thrown once. Find the probability of getting

(a) a prime no :

(i) $\frac{1}{2}$

(ii) $\frac{2}{3}$

(iii) $\frac{1}{6}$

(iv) None of these

(b) an even number

(i) $\frac{1}{4}$

(ii) $\frac{1}{6}$

(iii) $\frac{1}{2}$

(iv) $\frac{1}{3}$

(c) an odd number

(i) $\frac{1}{2}$

(ii) $\frac{1}{6}$

(iii) $\frac{1}{3}$

(iv) $\frac{1}{5}$

(d) number less than 5

(i) $\frac{2}{3}$

(ii) $\frac{3}{2}$

(iii) $\frac{1}{2}$

(iv) $\frac{1}{6}$

(e) a composite number

(i) $\frac{1}{3}$

(ii) $\frac{2}{3}$

(iii) $\frac{1}{6}$

(iv) None of these

20.

In fig.



Height = 12 cm

Radius = 5 cm

find its

(a) Curve surface area of cone

(i) 65π

(ii) 70π

(iii) 35π

(iv) None of these

(b) Total surface area of cone

(i) 90π

(ii) 45π

(iii) 100π

(iv) None of these

(c) Volume of cone

(i) 100π

(ii) 200π

(iii) 1000

(iv) None of these

(d) Area of base of cone

(i) 30π

(ii) 12.5π

(iii) 25π

(iv) None of these

(e) Slant height of cone

(i) 12 cm

(ii) 25 cm

(iii) 13 cm

(iv) 26 cm

Part-B

Section-II

All questions are compulsory. In case of internal choices, attempt any one.

21. Find two irrational number between 2 and 2.5.

22. The angles of a quadrilateral are in the ratio of 3 : 5 : 9 : 13. Find all angles of quadrilateral.

23. Show that angles of an equilateral triangle are 60° each.

Or

Draw a graph of linear equation $3 = 2x + y$.

24. An isosceles triangle has perimeter 30 cm and each of equal side is 12 cm, find the area of the triangle.

25. Factorise : $1 - 2ab - (a^2 + b^2)$

Or

In an experiment, a coin is tossed 600 times. If the tail turn up 240 times, find the probability of getting.

(i) a head

(ii) a tail.

26. Rationalise the denominator $\frac{1}{\sqrt{5} + \sqrt{2}}$

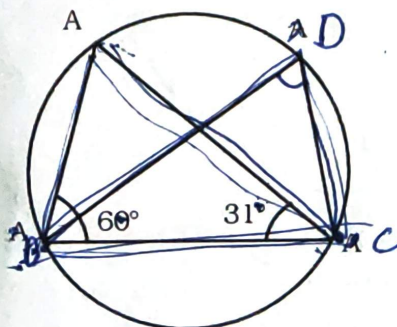
Section-IV

27. Two coins are tossed simultaneously 500 times, and we get two heads 105 times, one head 275 times, No head 120 times. Find the probability of occurrence of each of these events.

OR

Sides of triangle are in the ratio 12 : 17 : 25 and perimeter is 540 cm. Find its area.

28. In fig. $\angle ABC = 60^\circ$, $\angle ACB = 31^\circ$, find $\angle BDC$.



29. Construct a triangle ABC in which $BC = 6$ cm, $\angle B = 45^\circ$ and $AB - AC = 1.5$ cm

30. The diameter of the moon is approximately one fourth of the diameter of the earth. What fraction of the volume of earth is the volume of moon ?
31. Show that the bisectors of angles of a parallelogram form a rectangle.
32. If $2x + 3y = 13$ and $xy = 6$ find $8x^3 + 27y^3$.

OR

Factorise - $6x^2 + 7x - 3$

33. If the non parallel sides of a trapezium are equal, prove that it is cyclic.

Section-V

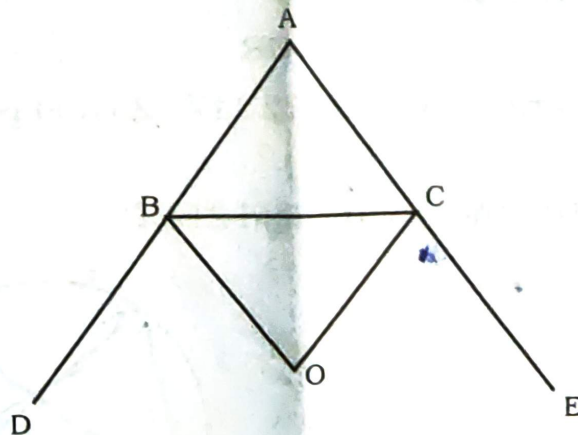
34. Show that if diagonals of quadrilateral bisect each other at right angles, then it is rhombus. 5

OR

Prove that the quadrilateral formed by the internal angle bisector of any quadrilateral is cyclic.

35. In fig. the sides AB and AC are produced to E and D respectively. If bisectors BD and CD of $\angle CBE$ and $\angle BCD$ respectively meet at O then prove that

$$\angle BOC = 90^\circ - \frac{1}{2}\angle BAC.$$



36. A rectangular tank 225 m by 162 m at the base. With what speed must water flow into it through an orifice 60 m by 45 cm that the level may be raised 20 cm in 5 hours ?