

**CBSE**  
**ANNUAL EXAMINATION (2019-20)**  
**SUBJECT: MATHEMATICS (SET-1)**

**CLASS: IX**

**MAXIMUM MARKS: 80**  
**TIME ALLOWED : 3 HOURS**

**General Instructions :**

- (i) The question paper comprises of four sections, A, B, C, and D.
- (ii) All questions are compulsory.
- (iii) Internal choices are given in Section B, C & D .
- (iv) Question 1 to 20 in Section-A carry 1marks each. Question 21 to 26 in section B carry 2 marks. Question 27 to 34 in Section-C carry 3 marks. Question 35 to 40 in Section-D carry 4 marks.
- (v) Use of calculator or any other electronic device is not allowed.

**SECTION :A ( Each question carries 1 mark )**

Q1. Which of the following is an irrational number :-

- a)  $\sqrt{\frac{9}{16}}$     b)  $\frac{\sqrt{20}}{\sqrt{5}}$     c)  $\sqrt{3}$     d)  $\sqrt{49}$

Q2. One of the factors of  $(25x^2 - 1) + (1 + 5x)^2$

- a)  $5+x$     b)  $5-x$     c)  $5x-1$     d) None

Q3. Which of the following points lie on negative side of x axis

- a)  $(-4,0)$ ;    b)  $(-3,2)$     c)  $(0, -4)$     d) None

Q4. Lines are parallel if they do not intersect is stated in the form of

- a) An axiom    b) A definition    c) A postulate    d) a proof .

Q5. An exterior angle of a triangle is  $105^\circ$  and it's two interior opposite angles are equal . Each of equal angle is

- a)  $37.5^\circ$     b)  $52.5^\circ$     c)  $72.5^\circ$     d)  $75^\circ$

Q6. D is a point on the side BC of  $\Delta ABC$  such that AD bisects  $\angle BAC$  then

- a)  $BD = CD$     b)  $BA > BD$     c)  $BD > BA$     d)  $CD > CA$

Q7. Area of an isosceles triangle having base 2 Cm and length of equal sides 4 Cm is

- a)  $\sqrt{15} \text{ cm}^2$     b)  $\frac{\sqrt{15}}{2} \text{ cm}^2$     c)  $2\sqrt{15} \text{ cm}^2$     d)  $4\sqrt{15} \text{ cm}^2$

Q8. A chord of a circle is equal to radius of circle . Then angle subtended at circumference on major arc is

- a)  $60^\circ$     b)  $120^\circ$     c)  $150^\circ$     and    d)  $30^\circ$

Q9. The height of a right circular cone is 12 Cm . If its volume be  $100\pi$  Cu.Cm. Then slant height is

- a) 10Cm    b) 11Cm    c) 13 Cm    d) 12 Cm

Q10. If the mean of the data 6,8,10,3,7 and m is 7 then the value of m is

- a) 7    b) 8    c) 6    d) 9

**Fill up :-**

Q11. In  $\Delta ABC$   $\angle A = 100^\circ$ ,  $AB = AC$ , then  $\angle B =$  \_\_\_ and  $\angle C =$  \_\_\_\_\_

Q12. Given two distinct points there is a \_\_\_\_\_ line that passes through them.

Q13.  $3.77\dots$  when expressed in  $\frac{p}{q}$  is \_\_\_\_\_

Q14. The value of K so that  $(x^2 - 2x + K)$  leaves remainder 3 when divided by  $(x + 1)$  is \_\_\_\_\_

Q15. Area of triangle , two sides of which are 18 Cm and 10 Cm and perimeter is 42 Cm is \_\_\_\_\_

**Solve**

Q16. The sides of a triangle are in the rate 5 : 4 : 3 if perimeter is 96 Cm , using Heron's formula , find area of triangle .

Q17. Insert a rational number and an irrational number between  $\frac{-2}{5}$  and  $\frac{1}{2}$ .

Q18. Simplify  $\frac{\sqrt{7} + \sqrt{2}}{3 + 2\sqrt{14}}$  .

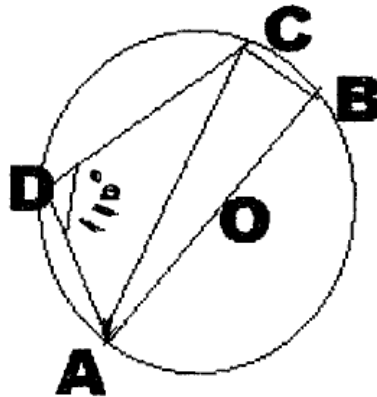
Q19. Mean of 11 numbers is 23. If 5 is added in every number find new mean .

Q20. The lateral surface area of cube is  $256m^2$ , what is the volume of the cube .

**SECTION B(Each question carries 2 marks)**

Q21. Factorise  $64m^3 - 343n^3$

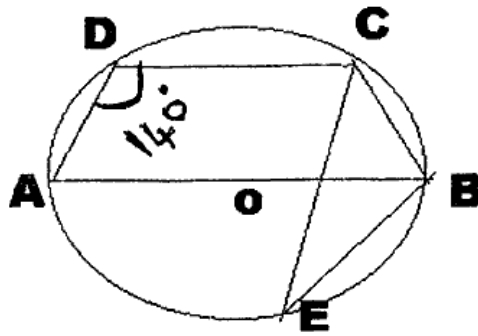
Q22. In the given fig. AB is the diameter. Find  $\angle BAC$ .



(OR)

(2)

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In the given fig,  $\angle ADC = 140^\circ$  and chord  $BC =$  chord  $BE$ . Find  $\angle CBE$

Q23. Find the radius of a sphere whose surface area is  $154\text{cm}^2$

(OR)

A river 3m deep and 40m wide is flowing at the rate of 2km/hr. How much water will fall into the sea in a minute?

Q24. Construct an angle of  $45^\circ$  and bisect it

Q25. If the mean of the following distribution is 6, find the value of 'p'

$x_i$	2	4	6	10	$P+5$
$f_i$	3	2	3	1	2

Q26. In one day cricket match, a batsman hits the boundaries 8 times and sixes 4 times out of 60 balls he plays. Find the probability that he i) hits boundaries ii) he hits sixes.

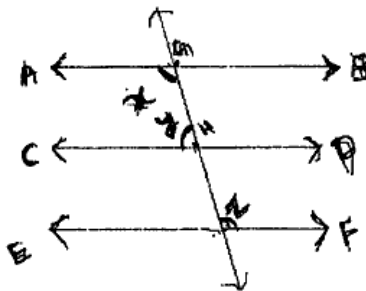
### SECTION C(Each question carries 3 marks)

Q27. Factorise  $x^3 + 13x^2 + 32x + 20$

Q28. Plot the points  $(1,1)$   $(2, -2)$  and  $(-1, -2)$  on a graph paper and find the area of the figure so obtained.

Q29. A lending library has a fixed charge for the first four days and an additional charges each day there after. Manan paid Rs. 50 for a book kept for 9 days. Write a linear equation of this statement in two variables and draw a graph.

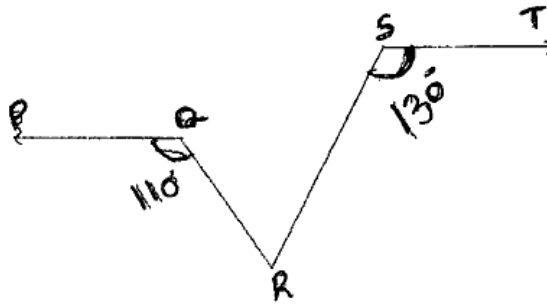
Q30. In the figure if  $AB \parallel CD$ ,  $CD \parallel EF$  and  $y : z = 3 : 7$ , find  $x$



(OR)

(3)

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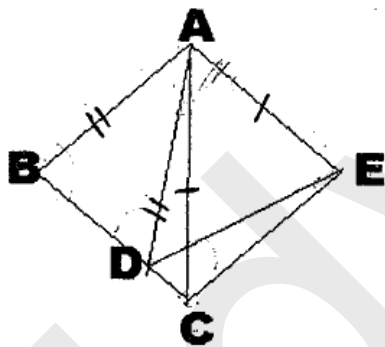


IF PQ||ST,  $\angle PQR = 110^\circ$  and  $\angle RST = 130^\circ$  then find  $\angle QRS$

Q31. Prove that the sum of any two sides of a triangle is greater than twice the median with respect to third side.

(OR)

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

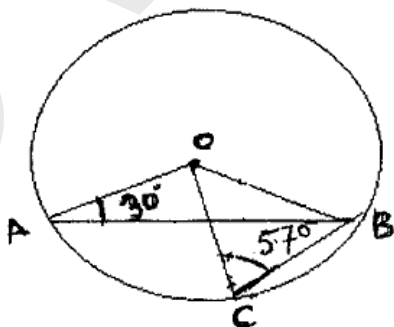


Q32. The area of a trapezium is  $475\text{cm}^2$  and the height is  $19\text{cm}$ . Find the length of its parallel sides, if one side is  $4\text{cm}$  greater than the other.

Q33. Prove that a cyclic parallelogram is a rectangle.

(OR)

In the given figure  $\angle OAB = 30^\circ$ ,  $\angle OCB = 57^\circ$ , find  $\angle BOC$ ,  $\angle AOC$



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(4)

Q34. Construct a triangle ABC in which  $\angle B = 60^\circ$ ,  $\angle C = 45^\circ$  and  $AB + BC + CA = 11\text{cm}$ .

**SECTION :D ( Each question carries 4 marks )**

Q35. If  $x = \frac{\sqrt{a+2b} + \sqrt{a-2b}}{\sqrt{a+2b} - \sqrt{a-2b}}$  prove that  $bx^2 - ax + b = 0$

Q36. Prove that the angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of circle .

Q37. If a triangle and a parallelogram are on the same base and between the same parallels then area of the triangle is equal to half the area of parallelogram . *True*

Q38. ABCD is a trapezium in which AB is parallel to CD and  $AD = BC$  . Show that  $\angle A = \angle B$ ,  $\angle C = \angle D$ ,  $\Delta ABC$  congruent to  $\Delta BAD$  and  $AC = BD$

**(OR)**

ABC is a triangle right angled at C . A line through the mid- point M of the Hypotenuse AB and parallel to BC intersect AC at D . Show that D is the mid- point of AC, MD is perpendicular to AC and  $CM = MA = \frac{1}{2} AB$

Q39. A cloth having a area of  $165\text{ m}^2$  is shaped into the form of conical tent of radius  $5\text{ m}$ . How many students can sit in the tent if a student on an average occupies  $\frac{5}{7}\text{ m}^2$  on the ground . Also find the volume of cone .

**(OR)**

A factory manufactures 120000 pencils daily . Pencils are cylindrical in shape each of length 25 cm and circumference is 1.5 cm . Determine the cost of coloring the curved surfaces of pencils manufactured in one day at Rs. 0.05 per  $\text{dm}^2$ .

Q40. In a city the following weekly observations were made in a student on cost of living index of year 1970-71.

Cost of Living Index	No of weeks
140-150	5
150-160	10
160-170	20
170-180	9
180-190	6
190-200	2

Draw a histogram and frequency polygon on same scale.

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