THE INDIAN SCHOOL
MOCK EXAMINATION 2016-17
MATHEMATICS CLASS IX

TIME: 3 Hrs. **No. of pages: 4**

Max Marks: 90

General instructions:

(i) All questions are compulsory.
(ii) The question paper consists of 31 questions divided into five sections A, B, C, D and E. Section-A comprises of 4 questions of 1 mark each, Section-B comprises of 6 questions of 2 marks each, Section-C comprises of 10 questions of 3 marks each and Section-D comprises of 11 questions of 4 marks each.
(iii) There is no overall choice.
(iv) Use of calculators is not permitted.

SECTION-A

Q1. Find the product: $\sqrt[3]{2}\sqrt[4]{2}\sqrt[12]{32}$

Q2. What is the value of k in the polynomial $x^3 + 3x^2 - kx - 3$, if x+3 is a factor of the polynomial?

Q3. In ΔABC, $\angle A - \angle B = 63^0$, $\angle B - \angle C = 18^0$. Find the measure of $\angle B$.

Q4. Find the reflection of the point P (4, -4) from the x-axis.

SECTION-B

Q5. Express $32.12\overline{35}$ as vulgar fraction.

Q6. Give possible expression for the length and breadth of the rectangle, which has $Area = a^2 - 6a + 8$.

Q7. The degree measure of three angles of a triangle are x, y and z. If $z = \frac{x+y}{2}$, then find the value of z.

Q8. Read the following statement:
"An equilateral triangle is a polygon made up of three line segments out of which two line segments are equal to the third one and all its angles are 60^0 each."
Define the terms used in this definition which you feel necessary. Are there any undefined terms in this?

Q9. Find the perimeter of an isosceles right angled triangle having an area of 200 cm^2.

Q10. Plot the points B (3, 4) and C (7, 4) on the graph paper and then plot A so that ABC is isosceles triangle.

SECTION-C

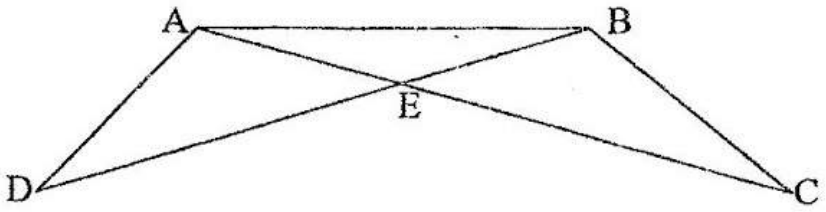
Q11. Show that $\sqrt{x^{-1}y^{-1}}.\sqrt{xy} - \frac{1}{\sqrt{x^{-1}y^{-1}}}.\frac{1}{\sqrt{xy}} = 0$, where x and y are positive real numbers.

Q12. Express $\frac{1}{1+\sqrt{2}-\sqrt{3}}$ with rational denominator.

Q13. Represent $(1 + \sqrt{9.5})$ on the number line.

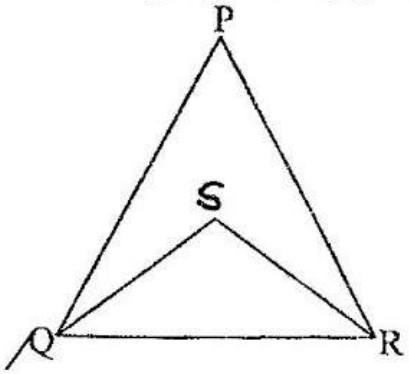
Q14. If a, b and c are all non-zero and a + b + c = 0, prove that: $\frac{a^2}{bc} + \frac{b^2}{ac} + \frac{c^2}{ab} = 3$.

Q15. In the given figure, $\angle EAB = \angle EBA$ and AC = BD. Prove that AD = BC.

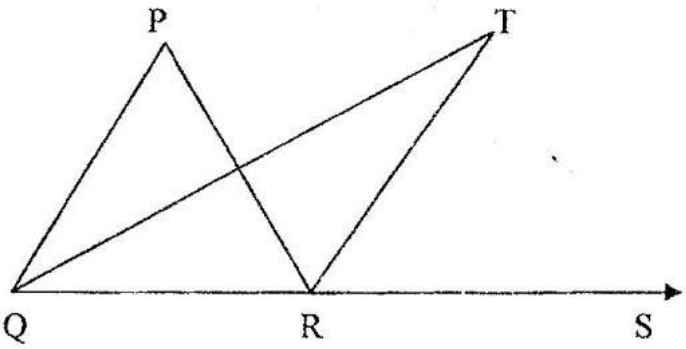


Q16. . If two diagonals of a rhombus are of lengths 240m and 44m, then find the height and the perimeter of the rhombus.

Q17. In the figure, S is any point in the interior of ΔPQR. Show that SQ + SR < PQ + PR.



Q18. In the given figure, the side QR of a triangle PQR is produced to a point S. If the bisectors of ∠PQR and ∠PRS meet at a point T, then prove that $\angle QTR = \frac{1}{2}\angle QPR$.



Q19. Find the area of the trapezium in which parallel sides are 25 cm and 10 cm and the non parallel sides are 14 cm and 13 cm.

Q20. WXYZ is a quadrilateral whose diagonals intersect each other at the point O such that OW = OX = OZ. If $\angle OWX = 50^0$, then find the measure of ∠OZW.

SECTION-D

Q21. Let $a = 7 - 4\sqrt{3}$ *and* $f(a) = \sqrt{a} + \frac{1}{\sqrt{a}}$.
Choose the correct value of $f(a)$ from
a) 2 b) 3 c) 4 d) 5
A student guessed a) 2 to be the correct value. Another student got hint from his friend to choose d) 5 as the correct value.
What is the correct value of $f(a)$? Why guess work or any type of cheating is bad in the examination?

Q22. Prove that: $\frac{1}{3+\sqrt{7}} + \frac{1}{\sqrt{7}+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{3}} + \frac{1}{\sqrt{3}+1} = 1$.

Q23. If $\frac{9^n \times 3^2 \times (3^{-n/2})^{-2} - 27^n}{3^{3m} \times 2^3} = \frac{1}{27}$, prove that $m - n = 1$.

Q24. The polynomials $ax^3 - 3x^2 + 4$ *and* $2x^3 - 5x + a$ when divided by (x - 2) leave the remainder p and q respectively. If $p - 2q = 4$, find a.

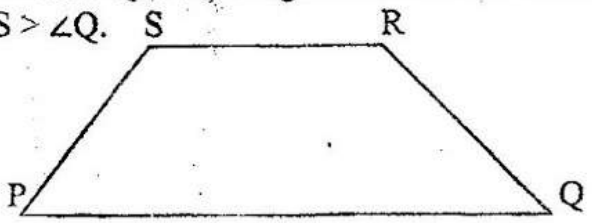
Q25. Using factor theorem, show that $(a + b), (b + c)$ *and* $(c + a)$ are the factors of $(a + b + c)^3 - (a^3 + b^3 + c^3)$.

Q26. For spreading the message "Save Environment Save Future" a rally was organised by some students of a school. They were given triangular cardboard piece ABC which they divided in two parts by drawing the angle bisectors BO and CO of base angles B and C. Prove that $\angle BOC = 90^0 + \frac{1}{2}\angle A$. What is the benefit of these types of rallies?

Q27. If $(z^2 + \frac{1}{z^2}) = 18$, find the value of $z^3 - \frac{1}{z^3}$, using only the positive value of $z - \frac{1}{z}$.

Q28. Prove that two triangles are congruent if two angles and the included side of one triangle are equal to the two angles and the included side of the other triangle.

Q29. In the figure, PQRS is a quadrilateral in which PQ is the longest side and RS is its shortest side. Prove that $\angle R > \angle P$ and $\angle S > \angle Q$.



Q30. Factorise: $2x^4 + x^3 - 14x^2 - 19x - 6$.

Q31. In the figure $l \parallel m \parallel n$. From the figure find the value of $(y + x) : (y - x)$ and the values of z and t.