9th

SUMMATIVE ASSESSMENT – I, 2012
MATHEMATICS
Class – IX

MA1-035

Time allowed : 3 hours | Maximum Marks : 90

General Instructions:

(i) All questions are **compulsory**.

(ii) The question paper consists of **34** questions divided into four **sections A, B, C and D. Section-A** comprises of **8** 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 **10** questions of **4 marks** each.

(iii) Question numbers **1** to **8** in **Section-A** are multiple choice questions where you are required to select one correct option out of the given four.

(iv) There is no overall choice. However, internal choices have been provided in **1** question of **two marks, 3** questions of **three marks** each and **2** questions of **four marks** each. You have to attempt only one of the alternatives in all such questions.

(v) Use of calculator is not permitted.

SECTION-A

Question numbers 1 to 8 carry 1 mark each. For each question four alternatives choices have been provided of which one is correct. You have to select the correct choice.

1. The simplified value of $(81)^{-1/4} \times \sqrt[4]{81}$ is :

(A) 9 (B) 3 (C) 1 (D) 0

2. $\sqrt{2}$ is the polynomial of degree :

(A) 0 (B) 1 (C) 2 (D) $\sqrt{2}$

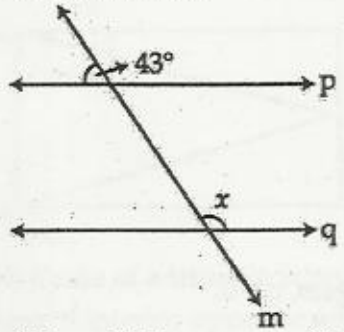
3. If $p(x) = 3x^3 - 2x^2 - x + 4$ then $p(-1)$ is equal to :

(A) -2 (B) 4 (C) 0 (D) 6

4. $\left(\sqrt{2} + \frac{1}{\sqrt{2}}\right)^2$ is equal to :

(A) $4\sqrt{2}$ (B) $\frac{9}{2}$ (C) $\frac{4}{\sqrt{2}}$ (D) 9

5. If p‖q then x is :



(A) 137° (B) 11° (C) 43° (D) 47°

6. If in a triangle XYZ, $\angle Y > \angle X$ and XY = 13 cm, then XZ is :

(A) 8 cm (B) 9 cm (C) 13.5 cm (D) 13 cm

7. If a point is on negative side of y-axis at a distance of 3 units from origin then, the co-ordinates of the point are :
(A) $(0, 3)$ (B) $(0, -3)$ (C) $(3, 0)$ (D) $(-3, 0)$

8. Co-ordinate of a point are $(-2, 3)$. Its distance from x-axis is :
(A) 2 units (B) -3 units (C) -2 units (D) 3 units

SECTION-B

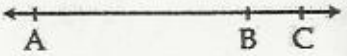
Question numbers 9 to 14 carry 2 marks each.

9. Write in simplest form :
$8\sqrt{45} + 2\sqrt{50} - 3\sqrt{147}$

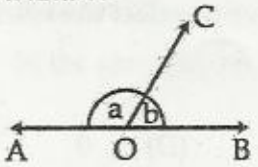
10. Find the value of k, such that $x-1$ is a factor of $5x^3 + 4x^2 - 6x + 2k$

11. Factorise $x^4 - 125\,xy^3$

12. In the figure, if A, B and C are three points on a line and B lies between A and C, then prove that AB + BC = AC.

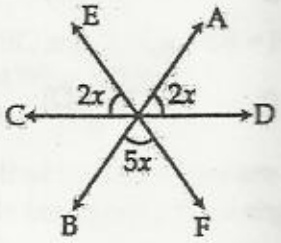


13. In the given figure $\angle AOC$ and $\angle BOC$ form a line AB. If $a - b = 80°$, find the values of a and b.



OR

In the given figure, AB, CD and EF are three lines concurrent at O. Find the value of x.



14. The perimeter of a Δ is 120 cm and its sides are in the ratio 5 : 12 : 13. Find the area of the triangle

SECTION-C

Question numbers 15 to 24 carry 3 marks each.

15. Simplify : $\left[5^2\left(8^{1/3} + 27^{1/3}\right)^3\right]^{1/5}$

OR

Express $0.\overline{235}$ in the form p/q where p and q are integers, $q \neq 0$.

16. Find the value of a and b, if
$$\frac{\sqrt{2} + \sqrt{3}}{3\sqrt{2} - 2\sqrt{3}} = a + b\sqrt{6}.$$

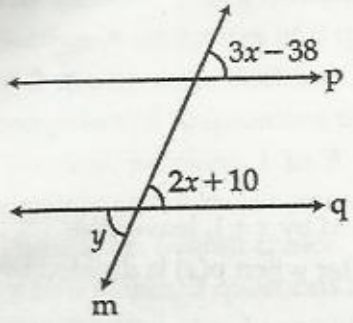
17. If $2x-1$ is a factor of $4x^3-16x^2+10x+k$ then find the value of k.

OR

If $x=2y+6$, find the value of $x^3-8y^3-36xy-216$.

18. If $a^2+b^2+c^2=280$, and $ab+bc+ca=\frac{9}{2}$, then find the value of $(a+b+c)^3$.

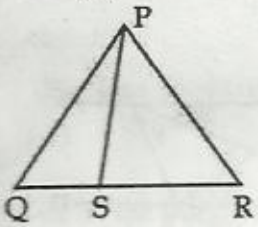
19. What is the value of y, if p and q are parallel to each other.



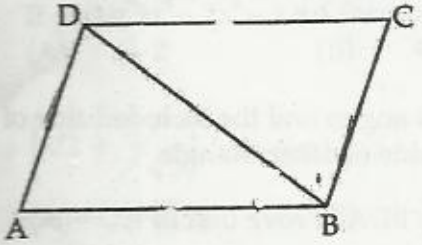
OR

In the given figure, $\angle PQR=\angle PRQ$, then prove that $\angle PQS=\angle PRT$. Also find $\angle P$ if $\angle PQR=70°$.

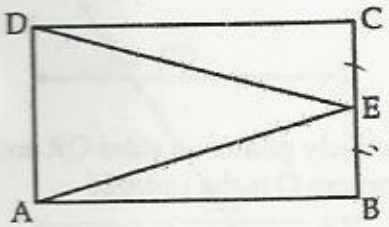
20. S is any point on the side QR of a triangle PQR. Prove that $PQ+QR+RP>2PS$.



21. In the given figure $AB=CD$, $\angle ABD=\angle CDB$. Prove that $AD=CB$.



22. In a rectangle ABCD, E is a point which bisects BC. Prove that $AE=ED$.



23. "If a side of a triangle is produced, then the exterior angle so formed is equal to the sum of interior opposite angles". Prove it.

24. Find the area of the quadrilateral, ABCD where AB = 7 cm, BC = 6 cm, CD = 12 cm, DA = 15 cm and AC = 9 cm.

SECTION-D

Question numbers 25 to 34 carry 4 marks each.

25. If $p = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $q = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, find p^2+q^2.

OR

Show that $\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2} = 5$.

26. Simplify $\frac{4\sqrt{3}}{2-\sqrt{2}} - \frac{30}{4\sqrt{3}-3\sqrt{2}} - \frac{3\sqrt{2}}{3+2\sqrt{3}}$

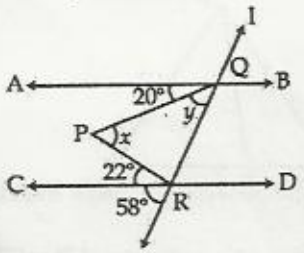
27. Factorise $2x^3 - x^2 - 13x - 6$.

28. The polynomial $p(x) = 2x^3 - 3x^2 + ax - 3a + 9$ when divided by $x+1$, leaves the remainder 16. Find the value of a. Also find the remainder when $p(x)$ is divided by $x+2$.

29. Verify $x^3 - y^3 = (x-y)(x^2+xy+y^2)$. Hence factorise $216x^3 - 125y^3$.

30. Three vertices of a rectangle ABCD are A(1, 3), B(1, −1) and C(−1, −1). Plot these points on a graph paper and hence use it to find the coordinates of the 4th vertex D. Also find the area of the rectangle.

31. In the given figure, find the value of x and y if AB||CD.

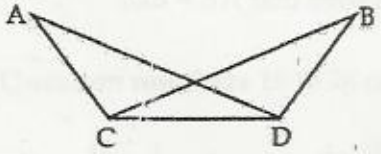


32. In ΔABC and ΔPQR, AB = PQ, AC = PR and altitude AM and PN are equal. Show that ΔABC ≅ ΔPQR.

OR

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

33. In the given figure, ∠BCD = ∠ADC and ∠ACB = ∠BDA. Prove that (i) AD = BC, (ii) ∠A = ∠B.



34. In the given figure, RP = RQ and M and N are respectively points on sides QR and PR of ΔPQR, such that QM = PN. Prove that OP = OQ where O is the point of intersection of PM and QN.