

Std. 9  
21-9-2016

Summative Assessment I in **MATHEMATICS**

Time : 3 hrs.  
M. Marks : 90

General Instructions:

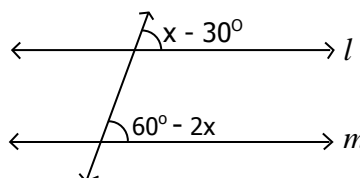
- i) Attempt all the questions.
- ii) This question paper consists of 31 questions divided into four sections A, B, C and D. Section A comprises of 4 questions of 1 mark each, section B comprises of 6 questions of 2 marks each, section C comprises of 10 questions of 3 marks each and section D comprises of 11 questions of 4 marks each.

SECTION – A

(1 x 4 = 4 marks)

1. Find the product of  $2\sqrt{3}$  and  $5\sqrt{3}$ .

2. Find the value of  $x$ , in the figure, for which  $l$  is parallel to  $m$ .

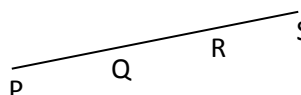


3. If  $x - 2$  is a factor of  $x^3 + px - 2px^2 - 2$ , then find the value  $p$ .
4. If A, B and C are three points on a line and B lies between A and C, then prove that  $AB + BC = AC$ .

SECTION – B

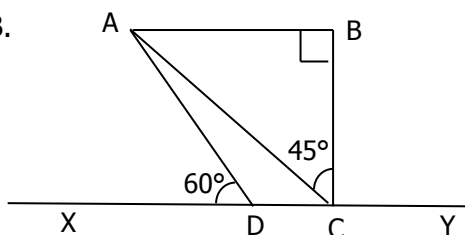
(2 x 6 = 12 marks)

5. In the given figure,  $PR = QS$  then prove that  $PQ = RS$ .



6. Find the area of a triangle whose sides measure 24cm, 18cm and 30cm.
7. If two lines intersect each other then prove that vertically opposite angles are equal.
8. Find four rational numbers between  $-\frac{6}{7}$  and  $-\frac{7}{6}$ .
9. A square ABCD is drawn in the first quadrant. If two of its vertices A and B lie on (2, 2) and (7, 2) respectively then write the coordinates of its other two vertices.

10. In the given figure  $XY \parallel AB$ . Find  $\angle DAC$ .

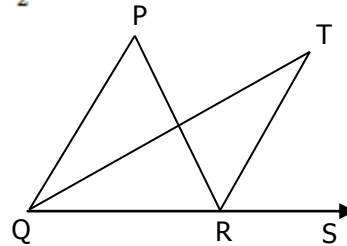


SECTION – C

(3 x 10 = 30 marks)

11. If  $p(x) = 2x^2 - x + 3$  then evaluate  $p(-2) - p(1) + p(\frac{1}{2})$ .

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



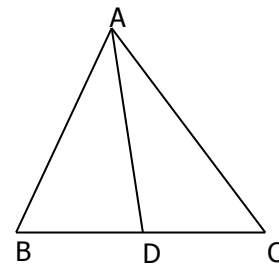
13. Factorise :  $8a^3 - 27b^3 + 8c^3 + 36abc$ .

14. If  $x = 2 + \sqrt{3}$ , then find the value of  $x^2 + \frac{1}{x^2}$ .

15. A field is in the shape of a parallelogram whose adjacent sides measure 125m and 85m. The measure of one of its diagonal is 60m. Find the area of this parallelogram.

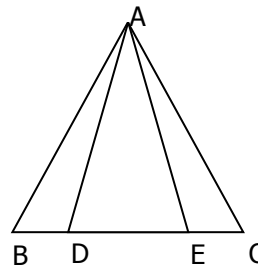
16. Evaluate :  $\frac{1}{\sqrt{7}+\sqrt{6}} + \frac{1}{\sqrt{6}+\sqrt{5}}$

17. In the given figure  $AC > AB$  and AD bisects  $\angle BAC$ . Prove that  $\angle ADC > \angle ADB$ .  
A farmer grows vegetables in  $\Delta ABC$  and donates all the vegetables produced in  $\Delta ABD$  to an orphanage. What value/s are shown by this act of the farmer?



18. Check whether the polynomial  $p(x) = 4x^2 - x + 4x^3 - 1$  is a multiple of  $(1 + 2x)$ .

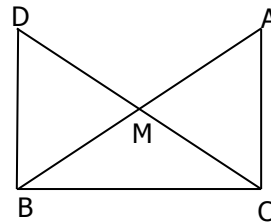
19. In the figure,  $AB = AC$  and D and E are points on the side BC such that  $BD = EC$ . Prove that  $AD = AE$ .



20. Prove that  $(a + b)^3 - (a - b)^3 - 6a^2b + 6b^3 = 8b^3$ .

SECTION – D (4 x 11 = 44 marks)

21. In the right  $\triangle ABC$ , right angled at C, M is the mid point of hypotenuse AB. C is joined to M and produced to a point D such that  $DM = CM$ . Point D is joined to B. Show that



- i)  $\triangle AMC \cong \triangle BMD$   
 ii)  $\angle DBC$  is a right angle

22. Factorise i)  $7\sqrt{2}x^2 - 10x - 4\sqrt{2}$  (ii)  $a^2 + b^2 - 2ab - 1$
23. Plot the points P(-3, 3), Q(-4, -2), R(2, -2) and S(3, 3) on the graph. Hence name the figure so formed after joining P, Q, R and S in order. Also find the area of the figure so formed.
24. Show that of all the line segments drawn from a given point not on it, the perpendicular line segment is the shortest.
25. Factorise:  $\frac{1}{8}x^3 + \frac{1}{4}x^2y + \frac{1}{6}xy^2 + \frac{1}{27}y^3$
26. Represent  $\sqrt{8.5}$  on the number line.
27. AB is a line segment. P and Q are points on the opposite side of AB such that each of them is equidistant from the points A and B. Show that the line PQ is the perpendicular bisector of AB.
28. Factorise :  $2x^3 + x^2 - 13x + 6$
29. Simplify: i)  $(125)^{\frac{-2}{3}} \times 64^{\frac{2}{3}}$   
 ii) Write  $0.\overline{48}$  in the form of  $p/q$ , where p, q are integers and  $q \neq 0$ .
30. Prove that the angles opposite to the equal sides of an isosceles triangle are equal.
31. i) Factorise  $8x^3 + 343$ .  
 ii) Expand  $(a + 2b - c)^2$ .