SUMMATIVE ASSESSMENT – I, 2016-17
MATHEMATICS
Class – IX

Time Allowed : 3 hours **Maximum Marks: 90**

General Instructions:

1. All questions are **compulsory**.
2. The 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.
3. There is no overall choice in this question paper.
4. Use of calculator is not permitted.

SECTION-A

Question numbers **1** to **4** carry one mark each.

1 Simplify: $\sqrt[4]{\left(\frac{132}{143}\right)^{-2}}$

2 Factorise : $x^2 - 16$.

3 Define a pair of complementary angles ?

4 Find the area of a triangle whose base is 8 cm and perpendicular is 12 cm.

SECTION-B

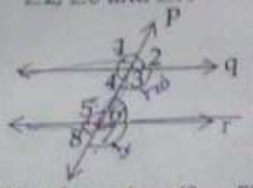
Question numbers **5** to **10** carry two marks each.

5 Express $18.\overline{48}$ in the form of $\frac{p}{q}$, where p and q are integers , $q \neq 0$

6 If $x = \frac{1}{2\sqrt{3}}$ is a zero of the polynomial $p(x) = 2kx^2 - 7x + k$, then find the value of k.

7 Prove that "Two distinct lines cannot have more than one point in common".

8 In the figure, transversal p intersects two parallel lines q and r such that $\angle 3 = 120°$. Find $\angle 1$, $\angle 2$, $\angle 5$ and $\angle 7$.



9 Plot the points $(0, -5)$ and $(-2, -5)$ on the cartesian plane.

10 The longest side of a right angled triangle is 90 cm and one of the remaining two sides is 54 cm. Find its area.

SECTION-C

Question numbers **11** to **20** carry three marks each.

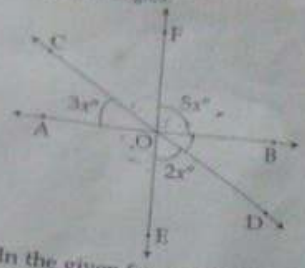
11 Examine whether $\sqrt{2}$ is rational or irrational

12 Rationalise the denominator of $\frac{4\sqrt{3}+5\sqrt{2}}{4\sqrt{3}+3\sqrt{2}}$

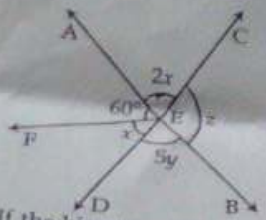
13 Prove that $4x^4 + 12x^2 + 15$ has no zeroes.

14 Simplify : $(2x+p-c)^2-(2x-p+c)^2$

15 In the given figure, lines AB, CD and EF meet at O. Find the value of x, hence find all the three indicated angles. 1 1 1

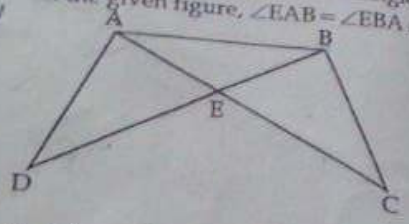


16 In the given figure, two lines AB and CD intersect each other at a point E. Find the values of x, y and z. 3



17 If the bisector of the exterior angle C of a ΔABC is parallel to the side AB, then prove that the triangle ABC is an isosceles triangle. 3

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



19 Plot the points A(4, 6), B(−2, 3), C(−2, −3) and D(4, −7) on graph paper. On joining the points in order, what figure do you get?

20 Sides of a triangular field are 25 m, 45 m and 50 m. Find its area and the altitude corresponding to the longest side. (Use $\sqrt{14} = 3.73$)

Question numbers 21 to 31 carry four marks each.

SECTION D

21 If $x = \frac{1}{7+4\sqrt{3}}$ and $y = \frac{1}{7-4\sqrt{3}}$, find the value of $x^3 + y^3$. 4

22 Simplify : $(\sqrt{x})^{-\frac{3}{5}}\sqrt{y^3} + \sqrt{xy^{-\frac{3}{5}}}\sqrt{x^{-2}y^3}$ 4

23 Find the values of p and q so that $(x+1)$ and $(x-1)$ are the factors of the polynomial $x^4 + px^3 + 2x^2 - 3x + q$. 4

24 Find the quotient when $f(x) = x^3 + 3x^2 + 3x + 2$ is divided by $g(x) = x + 2$. Also, find the remainder. 4

25 Factorise : $\frac{1}{64}x^3 - 8y^3 + \frac{3}{16}x^2y - \frac{3}{2}xy^2$ 4

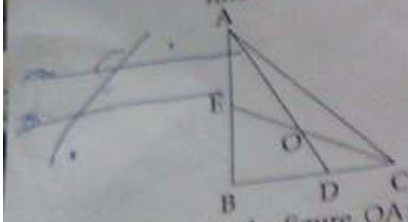
26 Simplify : $(6m-n)(36m^2 + 6mn + n^2) + (6m+n)^2$ 4

27 There is a triangular park ABC whose two corner angles A and B are 50° and 60° respectively. Three friends Rashmi, Sita and Geeta go daily for a morning walk and walk along these three sides AB, BC and AC respectively. Who walks maximum distance among these three ? Who walks least ? Why morning walk is necessary for us ? 4

28 In the given figure, we have X and Y are the mid-points of AB and BC and AX = BY. Show that AB = BC. State which axiom you use here. Also give two more axioms other than this axiom used in the above situation.

29 A transversal intersects two parallel lines. Prove that the bisectors of any pair of corresponding angles so formed are parallel. 4

30 In the given figure, AD and CE are the bisectors of ∠A and ∠C respectively. If ∠ABC = 90°, find ∠ADC + ∠AEC. 4



31 In the figure, OA = OB, OC = OD and ∠AOB = ∠COD. Prove that AC = BD.