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.

SECTION-A

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

1 Find the value of $\frac{3^0 + 5^0}{4^0}$ 1

2 Factorise : $x^2 - 4x + 4$. 1

3 Two parallel lines AB and CD are intersected by a transversal PQ at R and S respectively. Draw the figure and write pairs of alternate interior angles. 1

4 If (a, b) = (0, −2), find value of a and b 1

SECTION-B

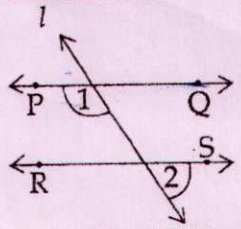
Question numbers **5** to **10** carry two marks each.

5 Express − 0.00875 in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$. 2

6 Find the remainder when the polynomial $p(y) = y^4 - 3y^2 + 2y + 6$ is divided by $y + 1$. 2

7 State any two of Euclid's five postulates. 2

8 In the figure, two parallel lines PQ and RS are intersected by a transversal l such that $\angle 1 : \angle 2 = 7 : 2$. Find $\angle 1$ and $\angle 2$. 2



9 Point P(2, 3) lies in which quadrant ? What will be the co-ordinates of a point Q opposite to it in fourth quadrant having equal distance from x-axis ? 2

10 If area of a right angled triangle is 240 m^2 and side other than hypotenuse is 30 m find the perimeter of the triangle. 2

SECTION-C

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

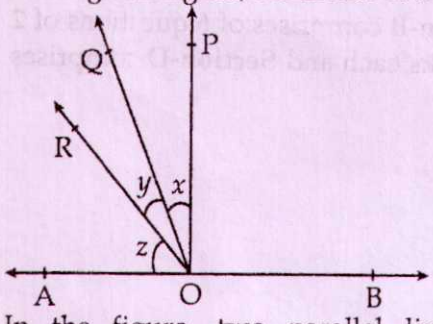
11 Represent $\sqrt{3}$ on the number line. 3

If $\frac{2-\sqrt{5}}{2+3\sqrt{5}} = \sqrt{5}\,a + b$, find a and b. 3

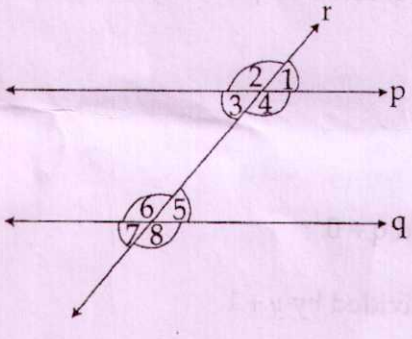
Prove that $\frac{0.87\times0.87\times0.87+0.13\times0.13}{0.87\times0.87-0.87\times0.13+0.13\times0.13} = 1$, using suitable identity. 3

If both $(x+2)$ and $(2x+1)$ are factors of ax^2+2x+b, prove that $a-b=0$. 3

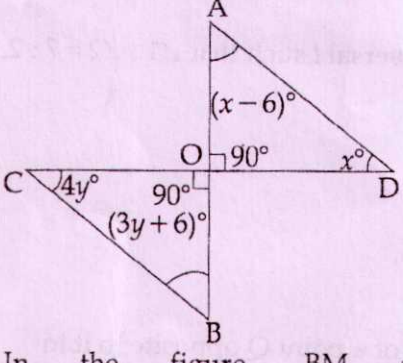
In the given figure, PO $\perp$ AB. If $x : y : z = 1 : 3 : 5$, then find the measures of x, y and z 3



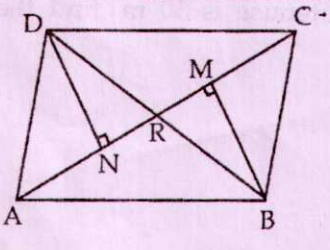
In the figure, two parallel lines p and q are intersected by a transversal r such that $\angle 2 : \angle 3 = 8 : 7$. Find all the angles. 3



Find x and y in the given figure. 3



In the figure, BM and DN are both perpendiculars to AC and BM = DN. Prove that AC bisects BD. 3



19 Locate the points A(2, 5), B(−3, 5), C(5, 0), D (0, 4), E(6, −3), F(−4, −8), G(3, −1) and H(−3, 0) in the cartesian plane. 3

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 $\sqrt{14} = 3.73$) 3

SECTION-D

Question numbers **21** to **31** carry four marks each.

21 If $x = 2 + \sqrt{3}$, find the value of $x^2 + \frac{1}{x^2}$. 4

22 For any positive real number x, prove that 4

$$\left(\frac{x^a}{x^b}\right)^{a+b} \times \left(\frac{x^b}{x^c}\right)^{b+c} \times \left(\frac{x^c}{x^a}\right)^{c+a} = 1$$

23 Find the value of p for which the polynomial $x^3 + 4x^2 - px - 10$ is exactly divisible by $x - 2$. Hence factorise the polynomial. 4

24 Show by long division that $2x + 3$ is a factor of $p(x) = 4x^4 + 8x^3 + 5x^2 + x - 3$. 4

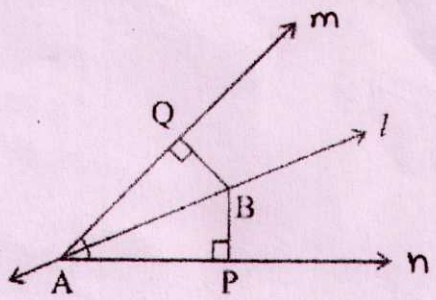
25 Factorise : $125a^3 - 27b^3 + 75a^2b - 45ab^2$ 4

26 If a, b, c are all non zero real numbers and a + b + c = 0, prove that 4

$$\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = 3.$$

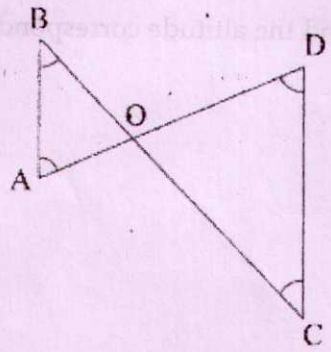
27 Two straight roads *m* and *n* intersect at point A. A student B starts from A and walks in such a way that it is equidistant from the roads *m* and *n*.Show that AB bisects ∠QAP. 4

Write briefly about the advantages of morning walk.

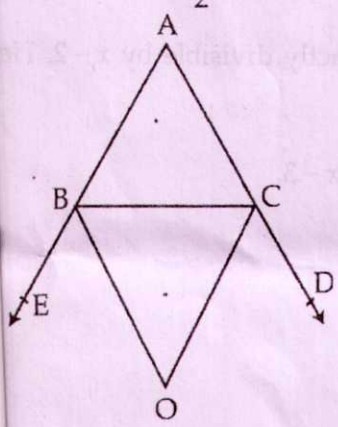


28 It is known that $a - c = 25$ and that $a = b$. Show that $b - c = 25$. Write the Euclid's axiom that best illustrates this statement. Also give two more axioms other than the axiom used in the above situation. 4

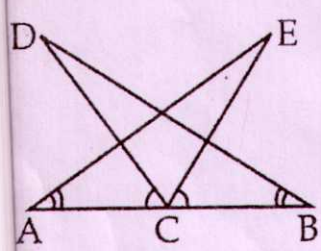
In the given figure, $\angle B < \angle A$ and $\angle C < \angle D$. Show that AD < BC. 4



In the figure, the sides AB and AC of ΔABC are produced to points E and D respectively. If bisectors BO and CO of $\angle CBE$ and $\angle BCD$ respectively meet at a point O, then prove that $\angle BOC = 90° - \frac{1}{2}\angle BAC$. 4



In the given figure, if AC = BC, $\angle DCA = \angle ECB$ and $\angle DBC = \angle EAC$, prove that DC = EC. 4



-o0o0o0o-