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. Find the value of $\dfrac{3^0 + 5^0}{4^0}$ **1**

2. Using appropriate identity, factorise $4x^2 - \dfrac{y^2}{9}$.   **1**

3. The two angles measuring $(30° - a)$ and $(125° + 2a)$ are supplementary to each other. Find the value of a.   **1**

4. The area of triangle of base 35 cm is 420 cm^2. Find the altitude.   **1**

SECTION-B

Question numbers 5 to 10 carry two marks each.

5. Insert three rational numbers between $\dfrac{-1}{3}$ and $\dfrac{-2}{3}$.   **2**

6. Find the remainder when the polynomial $f(x) = x^3 + 4x^2 - 3x + 5$ is divided by $x + 4$.   **2**
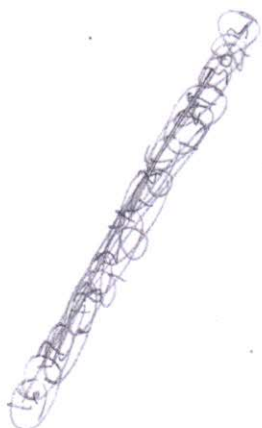
7. Define the terms and also draw them :   **2**
    (i) Parallel lines   (ii) Perpendicular lines

8. In the figure $l \| m$. If $\angle P = 90°$, $\angle RQP = 40°$ and $\angle PQS = 20°$, then find $\angle R$ and $\angle S$.   **2**

9 Find distances of following points from $y-$axis : 2
   $(3, 0), (0, -3), (2, -5)$ and $(-3, -1)$

10 Find the area of the right angled triangle in which sides other than hypotenuse are 18 cm and 2
   80 cm. Also, find the perimeter of the triangle.

SECTION-C

Question numbers 11 to 20 carry three marks each.

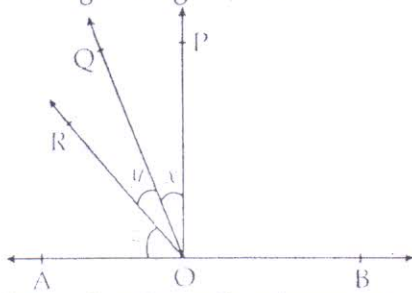11 Represent $\sqrt{8.5}$ on the number line. 3

12 $\dfrac{5 + \sqrt{11}}{3 - 2\sqrt{11}} = x + y\sqrt{11}$ है, तो x और y के मान ज्ञात कीजिए। 3

   If $\dfrac{5 + \sqrt{11}}{3 - 2\sqrt{11}} = x + y\sqrt{11}$, find the values of x and y .

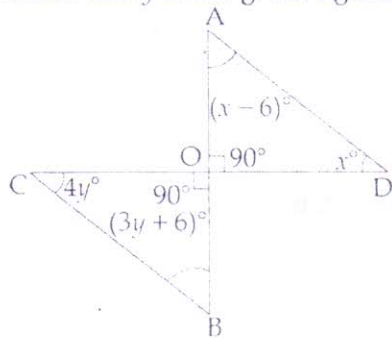13 If $x + \dfrac{1}{x} = 6$, find the value of $x^4 + \dfrac{1}{x^4}$. 3

14 Without actually calculating the cubes, find the value of $100^3 - 60^3 - 40^3$. 3

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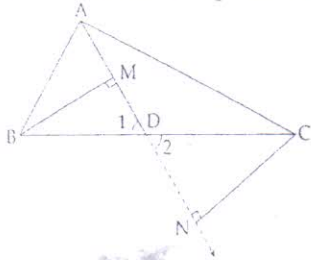

16 Prove that if two lines intersect, vertically opposite angles are equal. 3

17 Find x and y in the given figure. 3*

18   In given figure AD is the median of $\triangle ABC$. BM and CN are perpendiculars drawn from B and   3
      C to AD and AD produced respectively. Show that BM = CN.

19   State the quadrants in which the following points lie and also plot the points to verify your   3
      answer :
      $(-2, 3), (5, 4), (4, -2), (-2, -2)$

20   The sides of a triangle are in the ratio $3 : 4 : 5$. If perimeter of the triangle is 360 m, find its area   3
      using Heron's formula. Also find cost of fencing the triangle with barbed wire at the rate of
      Rs. 2 per meter.

SECTION-D

Question numbers 21 to 31 carry four marks each.

21   If $a = \dfrac{2 + \sqrt{3}}{2}$, then find the value of $a^2 + \dfrac{1}{a^2}$ 4

22   Final the value of :   4

      $(216)^{\frac{1}{3}} + 2\,(243)^{\frac{1}{5}} - 3\,(256)^{\frac{1}{8}}$

23   Using factor theorem, find the value of 'a', if $2x^4 - ax^3 + 4x^2 - x + 2$ is divisible by $2x + 1$.   4

24   Show by long division that $x - 3$ in a factor of $2x^4 + 3x^3 - 26x^2 - 5x + 6$.   4

25   Using   factor   theorem,   show   that $(a + b), (b + c)$ and $(c + a)$ are   factors   of   4
      $(a + b + c)^3 - (a^3 + b^3 + c^3)$.

26   Without actually calculating the cubes, find the value of $(-1)^3 + (-2)^3 + (-3)^3 + (-4)^3 + 2(5)^3$.   4
      Also write the identity used.

27   On Environment day, people in a colony were trying to develop a garden in the region ABC   4
      and a pond for fishes in the triangular region FED. What value is being exhibited by them by
      doing so ?
      In the given figure below BA $\perp$ AC, DE $\perp$ DF
      Such that BA = DE and BF = EC
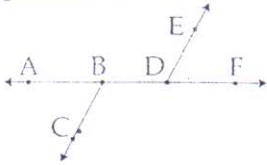   Show that $\triangle ABC \cong \triangle DEF$

28   It is known that $a - c = 25$ and that $a = b$. Show that $b - c = 25$. Write the Euclid's axiom that best   4

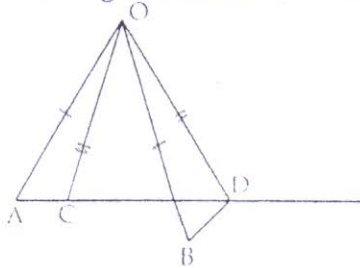illustrates this statement. Also give two more axioms other than the axiom used in the above situation.

29. In the given figure. $\angle ABC = 30°$, $\angle EDF = (40 - x)°$ and $\angle ADE = (13x + 20)°$. Show that BC is parallel to DE :   4

30. If two lines intersect each other, prove that the vertically opposite angles are equal. Using this result, find the value of x in the given figure.   4
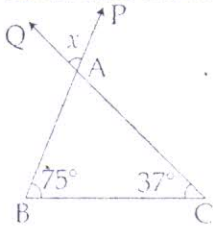
31. In the figure, OA = OB, OC = OD and $\angle AOB = \angle COD$. Prove that AC = BD.   4

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