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46

HOLY CHILD – V.V.   970L45F

SUMMATIVE ASSESSMENT – I, 2015-16
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: $[7(81^{1/4} + 256^{1/4})^{1/4}]^4$.   1

2   Write the quotient if $x^3 - 1$ is divided by $x^2 + x + 1$.   1

3   In $\triangle ABC$, if $\angle A - \angle B = 63°$ and $\angle B - \angle C = 18°$, find the measure of $\angle B$.   1

4   What are the coordinates of the point of intersection of x-axis and y-axis. What is this point   1
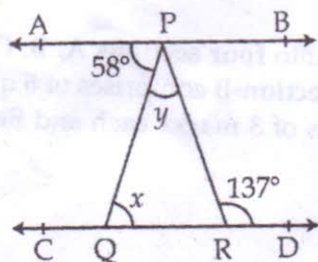called?

SECTION-B

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

5. Rationalise the denominator of $\dfrac{4}{5\sqrt{5}}$. 2

6. If $a - b = 5$ and $ab = 14$, then find the value of $a^3 - b^3$. 2

7. In given figure, if $AB \parallel CD$, $\angle APQ = 58°$ and $\angle PRD = 137°$, find the values of x and y. 2

8. If the angles of a triangle are in the ratio $2 : 3 : 4$, then find the smallest angle of the triangle. 2

9. Plot the points $A(3, 10)$, $B(-3, 5)$ and $C(-1, -6)$ on the graph paper. Join them in pairs and identify the figure so formed. 2

10. The base (unequal side) of an isosceles triangle is 4 cm and its perimeter is 20 cm. Find its area. 2

SECTION-C

Question numbers **11** to **20** carry three marks each.
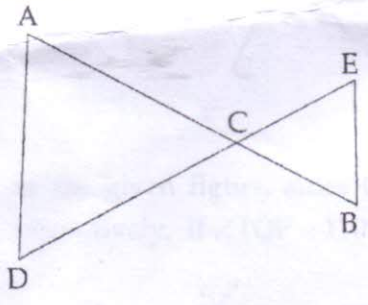
11. Find six rational numbers between 3 and 4. 3

12. If $a = 1 + \sqrt{7}$, find the value of $\dfrac{-6}{a}$. 3
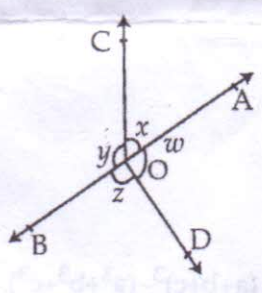
13. Factorise : $8a^3 + 8b^3$. 3

14 Find the value of 'a', if $x + a$ is a factor of the polynomial $p(x) = x^3 + ax^2 - 2x + a + 4$.

3

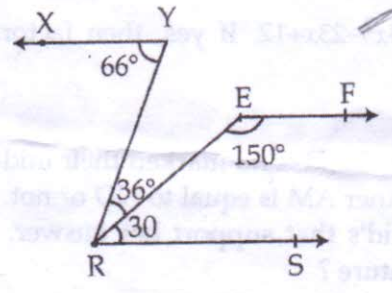15 In the given figure AC = DC and CB = CE. Show that AB = DE.

3

16 Prove that the angles opposite to equal sides of a triangle are equal.

3

17 In the figure, if $x + y = w + z$, then prove that AOB is a straight line.

3

18 In given figure, show that XY ∥ EF :

3

19 Write the co-ordinates of the point :

(i) whose ordinate is −5 and which lies on y-axis.

(ii) which lies on x and y axes both.

(iii) Whose abscissa is –3 and which lies on x-axis.

20. The sides of a triangular park are 5 m, 7 m and 8 m respectively. Find the cost of levelling the park at the rate of Rs. 10 per m². (Use $\sqrt{3} = 1.73$)   3

SECTION-D

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

21. If $x = \dfrac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $y = \dfrac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ then show that $x^2 + xy + y^2 = 99$.   4

22. Express : $0.6 + 0.\overline{7} + 0.4\overline{7}$ in the form $\dfrac{p}{q}$ where p and q are integers and $q \neq 0$.   4

23. Prove that $(x+y)^3 + (y+z)^3 + (z+x)^3 - 3(x+y)(y+z)(z+x)$
    $= 2(x^3+y^3+z^3-3xyz)$.   4

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

25. Show that $2x+3$ is a factor of $2x^3+5x^2-37x-60$. Also, find the other factors.   4

26. Verify if –3 and 4 are zeroes of the polynomial $2x^3-3x^2-23x+12$. If yes, then factorise the polynomial.   4

27. Teacher held two sticks AB and CD of equal length in her hands and marked their mid-points M and N respectively. She then asked the students whether AM is equal to ND or not. Arpita answered yes. Is Arpita correct ? State axiom of Euclid's that support her answer. Which characteristics of Arpita you want to inculcate in your nature ?   4

28. It is known that if $a+b = 10$ then $a+b-c = 10-c$. 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
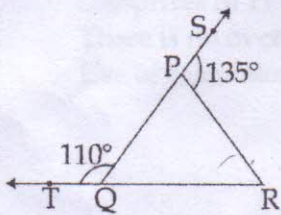
29   In given figure AB∥DE. Find ∠BCD.   4

A ← ──── B
       120°
            D ── E
            115°
         C
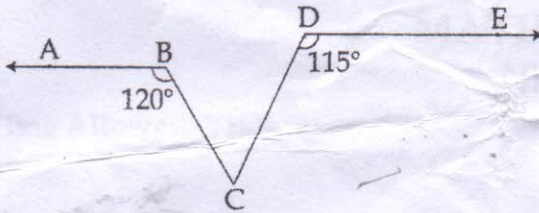
30   In the given figure, sides QP and RQ of a triangle PQR are produced to points S and T   4
      respectively. If ∠TQP = 110° and ∠RPS = 135°, find ∠PRQ.

         S
      P)135°
   110°
   T Q   R

31   The angles of a triangle are $(x-40)°$, $(x-20)°$ and $(\frac{x}{2}-10)°$. Find the value of x and all the   4
      angles of the triangle.

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