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

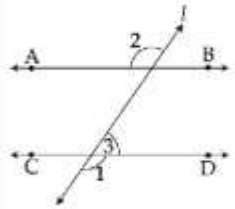
CPS _ Question paper - 3 [Code: EQRVQRF]

SECTION-A

1. Find the value of $(81)^{0.16} \times (81)^{0.09}$

2. Write $(x - 2)^3$ in the expanded form.

3 .In the given figure, AB II CD and / is a transversal. If <1=110°, find <2 and<3.



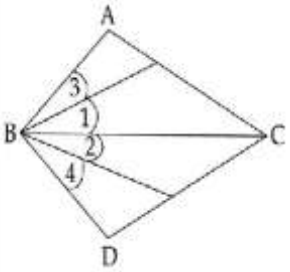
4. Point A is on y-axis and is at a distance of 3 units from x-axis on the positive side of y-axis. Write its coordinates

SECTION-B

5. Show that $(a^{x-y})^{x+y} \ (a^{y-z})^{y+z} \ (a^{z-x})^{z+x} = 1$

6 Find $x + \frac{1}{x}$ if $x^2 + \frac{1}{x^2} = 23$ Or, Resolve into factor 1 + a + b + c + ab + bc + ca + abc

7 .In the given figure, we have <1= <2 and <3 = <,4. Show that <ABC = <DBC. State the Euclid's axiom used by you.



8. Two line segments AB and CD intersect each other at O such that AO = OB and CO = OD. Prove that AC = BD.

9. The longest side of a right angled triangle is 125 m and one of the remaining two sides is 100 m. Find its area using Heron's formula.

10. In the coordinate plane, draw a square of side 3 units, taking origin as one vertex. Also, write the coordinates of its vertices.

SECTION-C

11. Represent $\sqrt{4.2}$ on the number line.

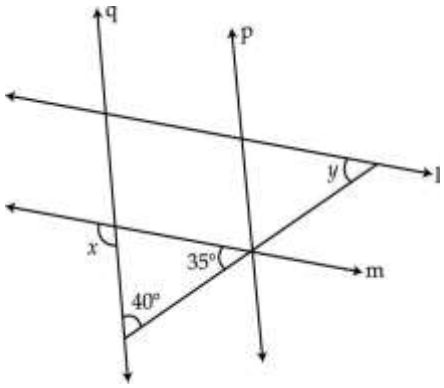
12.Find the values of a and b if $\frac{5+\sqrt{6}}{5-\sqrt{6}} = a + b\sqrt{6}$

13 One zero of the polynomial $2x^3 - 9x^2 - 2x + 24$ is 2. Find the other zeroes of the polynomial.

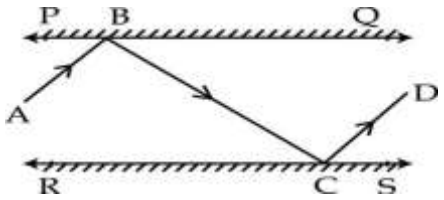
14 Factorise : $1000x^3 + 1331y^3 + 3300x^2y + 3630y^2x$

15. In ΔABC, it is given that <C - <A = 40^0 and <C- <B =20^0. Find <A, <B and <C.

16. In the figure, find x and y if $l \ II \ m, p \ II q$.



17. In figure PQ and RS are two mirrors placed parallel to each other. An incident ray AB strikes the mirror PQ at B, the reflected ray moves along the path BC and strikes the mirror RS at C and again reflects back along CD. Prove that ABIICD.



18. Prove that the sum of three angles of a triangle is 180^o

19. If two diagonals of a rhombus are of lengths 90 m and 400 m, then find the height and perimeter of the rhombus.

20. Locate the points A(1, 6), B(0, 4), C(7, 0), D(- 2, - 2), E(4,- 1), F(2, -3), G(-1, 1) and H(-2, - 3) in the Cartesian plane.

SECTION-D

21. if a = $\frac{\sqrt{2}+1}{\sqrt{2}-1}$ and b = $\frac{\sqrt{2}-1}{\sqrt{2}+1}$ find $x^2 + y^2 + xy$.

22. If a ,band c are non zero but their sum is zero, then show that $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = 3$

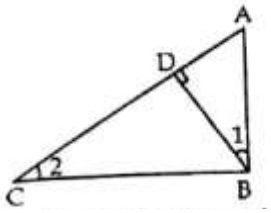
23. Find the values of p and q so that (x + 1) and (x - 1) are factors of $x^4 + px^3 + 2x^2 + 3x + q$

24. Give possible expressions for the length and breadth of the rectangle, in which the area is given by : $25a^2 - 35a + 12$

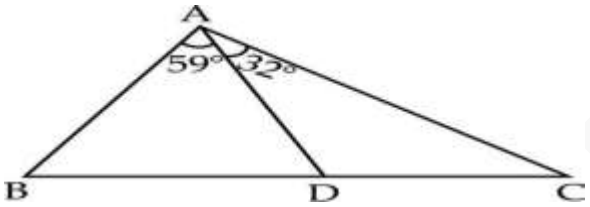
25. If the polynomial $b - x - 10x^2 + 8x^3$, is exactly divisible by 1 - *x*, then find value of b. Hence, factories the polynomial.

26 . The polynomial $p(x) = x^4 - 2x^3 + 3x^2 - ax + 3a - 7$ when divided by (*x* +1) leaves the remainder 19. Find 'a'. Then, find the remainder when p(*x*) is divided by *x* + 2.

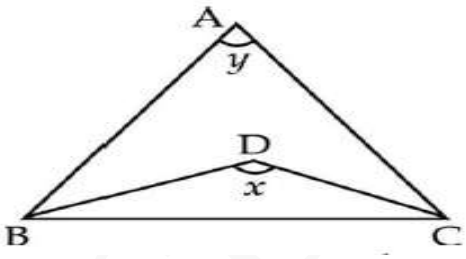
27. In figure ABC is a right triangle at B. BD is drawn perpendicular to AC.
Show that <1 =<2



28. In the given figure AD= BD. Prove that BD < AC.



29. In ∆ABC, BD and CD are internal bisector of > B and < C respectively. Prove that 180 + y = 2x.



30. Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of a ∆ PQR. Show that (i) ∆ ABM ≅ ∆PQN (ii) ∆ABC ≅ ∆PQR

31. Prove that any two sides of a triangle are together greater than twice the median drawn to the third side.

Extra:

1. if a = $\frac{\sqrt{5}+\sqrt{2}}{\sqrt{5}-\sqrt{2}}$ and b = $\frac{\sqrt{5}-\sqrt{2}}{\sqrt{5}+\sqrt{2}}$ find $\frac{a^2+ab+b^2}{a^2-ab+b^2}$

2. In given fig. ABCD is a square, P and Q are point on DC and BC such that AP = DQ. Prove that (i) ∆ ADP ≅ ∆ DCQ (ii) < DMP = 90^0