ESSENCE TEST-11

DATE : 01-09-19

9TH CLASS

CBSE(B1)

NUMBER SYSTEM, POLYNOMIAL,
LINES AND ANGLES & HERON'S FORMULA

Mantra to get the best outcome.....

Best solution

IIT-JEE/ NEET/ KVPY/ OLYMPIAD

MARKS : 80 **MATHEMATICS** **TIME : 3 :00 HR.**

SECTION – (A)

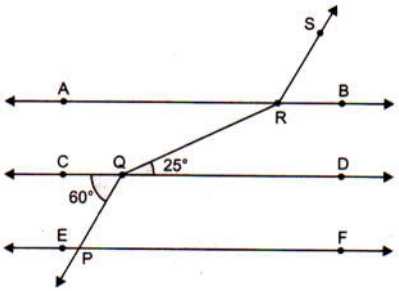
1. $\frac{1}{\sqrt{9}-\sqrt{8}}$ is equal to **[1]**

   (a) $\frac{1}{2}(3-2\sqrt{2})$ (b) $\frac{1}{3+2\sqrt{2}}$ (c) $3-2\sqrt{2}$ (d) $3+2\sqrt{2}$

2. The area of an isosceles triangle having base 2 cm and length of one of the equal sides 4 cm, is **[1]**

   (a) $\sqrt{15}$ cm^2 (b) $\sqrt{\frac{15}{2}}$ cm^2 (c) $2\sqrt{15}$ cm^2 (d)none of these

3. In figure, if AB||CD||EF, PQ||RS, ∠RQD = 25° and ∠CQP = 60°, then ∠QRS= **[1]**



   (a) 85° (b) 135° (c) 145° (d) 110°

4. The angles which differ by 38° and are complementary to each other, are

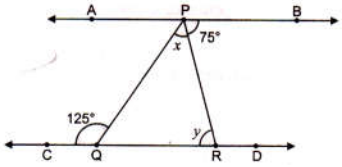
   (a) 38°, 52° (b) 71°, 109° (c) 26°, 154° (d) 64°, 26° **[1]**

SECTION – (B)

5. If $\sqrt{2}$ = 1.4142, then find the value of $\sqrt{\frac{\sqrt{2}+1}{\sqrt{2}-1}}$. **[2]**

6. If $\frac{x}{y}+\frac{y}{x}=-1$ ($xy \neq 0$), then find the value of $x^3 - y^3$. **[2]**

7. In figure, AB||CD, $\angle BPR = 75°$ and $\angle PQC = 125°$, find x and y. **[2]**



SECTION – (C)

8. Find five rational numbers p_1, p_2, p_3, p_4, p_5 between $\frac{2}{7}$ and $\frac{13}{35}$ so that

   $p_1 - \frac{2}{7} = p_2 - p_1 = p_3 - p_2 = p_4 - p_3 = p_5 - p_4 = \frac{13}{35} - p_5$. **[3]**

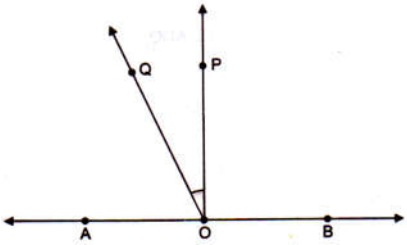
9. Factorise: $x^3 - 23x^2 + 142x - 120$. **[3]**

10. If $x-\frac{1}{x}=6$, evaluate $x^4+\frac{1}{x^4}$. **[3]**

11. If x and y be two positive real numbers such that $9x^2 + y^2 = 96$ and $xy = 8$, then find the value of $3x + y$. **[3]**

12. A park, in the shape of a quadrilateral ABCD has ∠C = 90°, AB = 10 m, BC = 8 m, CD = 6 m and AD = 6 m. Prove that the area of the quadrilateral is equal to 3 {8 + $\sqrt{91}$ } m^2. **[3]**

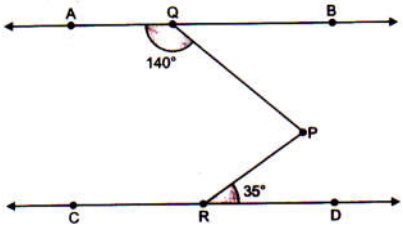
13. In figure, ray OP is perpendicular to the line AB at O. Another ray OQ is lying in between OA and OP. Prove that ∠POQ = $\frac{1}{2}$ {∠BOQ - ∠AOQ} **[3]**



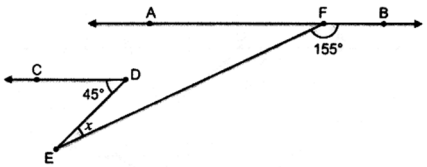
14. If $2^x = 3^y = 6^z$, show that $\frac{1}{z} = \frac{1}{x} + \frac{1}{y}$. **[3]**

15. A rhombus has perimeter 120 m and one of its diagonal is 50 m. Find the area of the rhombus. **[3]**

16. In figure, if AB||CD, ∠AQP = 140° and ∠PRD = 35°, find ∠QPR and reflex ∠QPR. **[3]**

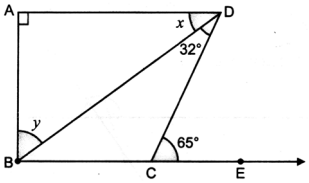


17. In figure, AB||CD, find angel x. **[3]**



SECTION – (D)

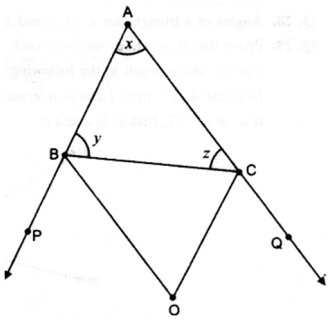
18. In figure, AD⊥AB, AD||BC, ∠DCE = 65° and ∠BDC = 32°, find the angles x and y. **[4]**



19. In figure, the sides AB and AC and ΔABC are produced respectively to points P and Q. If bisectors BO and CO of ∠CBP and ∠BCQ respectively, meet at point O, Prove that **[4]**

(i) $\angle BOC = \frac{1}{2}(y + z)$

(ii) $\angle BOC = 90° - \frac{1}{2}x$



20. Prove that $\left(\frac{1}{x^{a-b}}\right)^{\frac{1}{a-c}} \cdot \left(\frac{1}{x^{b-c}}\right)^{\frac{1}{b-a}} \cdot \left(\frac{1}{x^{c-a}}\right)^{\frac{1}{c-b}} = 1$ **[4]**

21. Prove that the area of the quadrilateral ABCD is $4\{\sqrt{3}+2\sqrt{2}\}$ m^2 if AB = 6, BC = 6 m, CD = 4 m, AD = 4 m and diagonal AC = 4 m. **[4]**

22. If $a+8\sqrt{5}\,b = \frac{8+\sqrt{5}}{8-\sqrt{5}} - \frac{8-\sqrt{5}}{8+\sqrt{5}}$, determine the rational numbers a and b. **[4]**

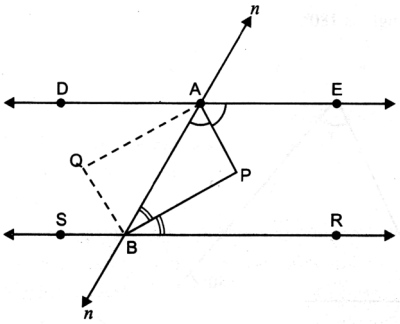
23. ABCD is a trapezium is which AB || CD ; BC and AD are non-parallel sides. It is given that AB = 75 cm, BC = 42 cm, CD = 30 cm and AD = 39 cm. Find the area of the trapezium. **[4]**

24. If x and y be two positive real numbers such that $8x^3 + 27y^3 = 730$ and $2x^2y + 3xy^2 = 15$, evaluate $2x + 3y$. **[4]**

25. If $x^{1/3} + \frac{1}{x^{1/3}} = 5$, find the value of $x^3 + \frac{1}{x^3}$. **[4]**

26. If $x^4 + \frac{1}{x^4} = 322$, prove that $x - \frac{1}{x} = 4$ or -4; x being a real number. **[4]**

27. in figure, DE||SR, AP and BP are bisectors of $\angle$EAB and $\angle$RBA respectively. Prove that $\angle$APB = 90°. Further, if AQ and BQ are bisectors of $\angle$DAB and $\angle$SBA respectively, prove that AQBP is a rectangle. **[4]**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