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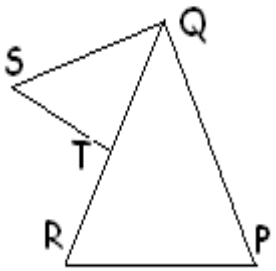
CLASS IX
SAMPLE PAPER
MATHS

SECTION - A

1. Evaluate $\frac{15}{\sqrt{10}+\sqrt{20}+\sqrt{40}-\sqrt{5}-\sqrt{80}}$ Given that $\sqrt{5}=2.236$ and $\sqrt{10}=3.162$
2. If $x^2-5x-1=0$, Find $x^2+\frac{1}{x^2}$
3. Does Euclid's 5th postulate imply the existence of parallel lines?
4. Three vertices of a rectangle ABCD A (1,3) B (1,-1) C (7,-1) Plot the points on the graph paper & use it to find the coordinates of the 4th vertex D. Also find the area of the rectangle.

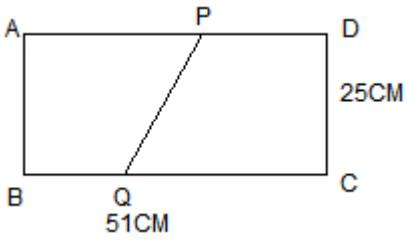
SECTION - B

5. Prove that : $\frac{a^{-1}}{a^{-1}+b^{-1}}+\frac{a^{-1}}{a^{-1}-b^{-1}}=\frac{2b^2}{b^2-a^2}$
6. If a,b,c are all non-zero & a+b+c=0, prove that $\frac{a^2}{bc}+\frac{b^2}{ca}+\frac{c^2}{ab}=3$
7. T is a point on side QR of Δ PQR & S is a point such that RT=ST Prove that PQ+PR>QS.



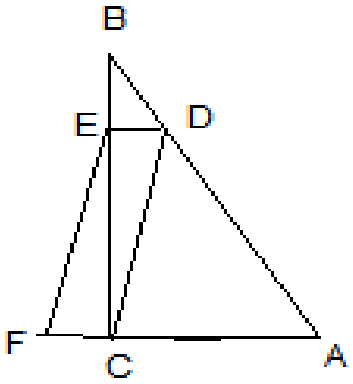
8. If the bisectors of ∠A & ∠B of a quadrilateral ABCD meets at O. Then ∠AOB=1/2 [∠C + ∠D].
9. If the coordinates of a point M are (-2, 9) which can also be expressed as $(1+x, y^2)$ & y>0, then find in which quadrant do the following points lie: P (y, x) ; Q (2, x) R (x^2, y-1) S (2x, -3y)

10. The dimensions of a rectangle ABCD are 51cm x 25cm. A trapezium PQCD with its parallel sides QC & PD in the ratio 9 : 8, is cut off from the rectangle (as in fig.). If the area of the trapezium PQCD is 5/6 of the area of rectangle ABCD. Find QC & PD.

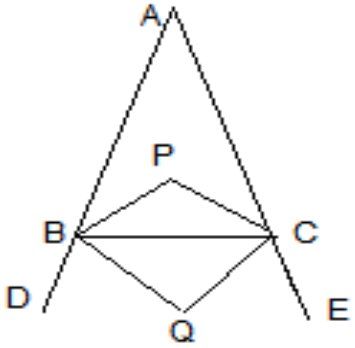


SECTION - C

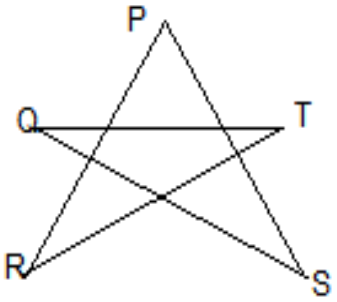
11. Rationalise : $\frac{30}{\sqrt{6}+\sqrt{5}-\sqrt{11}}$
12. Simplify $\sqrt[5]{x^4\ \sqrt[4]{x^3\ \sqrt[3]{x^2\ \sqrt{x}}}}$
13. If both (x-2) & (x – ½) are the factors of ax^2+5x+c Show that a=c.
14. If $x^2-bx+c=(x+p)(x-q)$ then factorise $x^2-bxy+cy^2$
15. The difference between semi-perimeter & sides of Δ ABC are 5 cm, 7cm & 8cm respectively. Find the area of triangle.
16. ∠ACB is a right angle & AC=CD & CDEF is a parallelogramIf ∠ FEC=10 Find ∠BDE. If ∠FEC =10Find ∠BDE



17. In ΔABC, sides AB & AC are produced to D & E respectively. BP, CP, BQ & CQ are bisectors of ∠ABC, ∠ACB, ∠CBD & ∠BCE respectively. Prove that $\angle BPC+\angle BQC=180^0$.

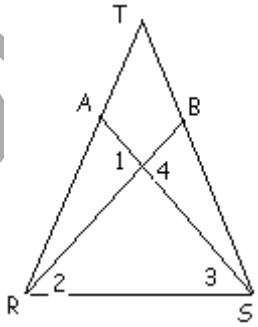


18. Find the value of ∠P+∠Q+∠R+∠S+∠T.



19. Plot points A(2, 0) B(2, 2) C(2, 2) D(0, 2). Join OA, AB, BC, CO. Name the fig. & calculate the area.

20. RT=TS, $\angle 1 = 2\angle 2$, $\angle 4 = 2\angle 3$. Prove that $\Delta RBT \cong \Delta SAT$.



SECTION - D

21. If abc=1 show that $\left(1+a+\frac{1}{b}\right)^{-1}+\left(1+b+\frac{1}{c}\right)^{-1}+\left(1+c+\frac{1}{a}\right)^{-1}=1$

22. Find the value of $\sqrt[3]{\sqrt{30}+\sqrt{3}} \times \sqrt[3]{\sqrt{30}-\sqrt{3}}$.

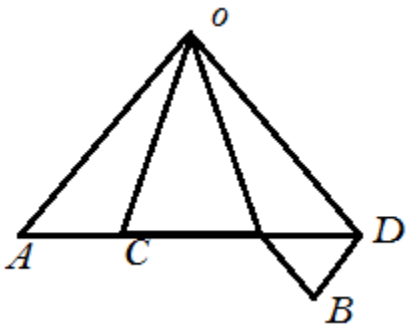
23. Factorise : $(3m^2-2m)(6-3m^2+2m)-5$

24. If $(x+y)^3-(x-y)^3-6y(x^2-y^2)=ky^3$ Find the value of 'k'

25. Resolve into factors : (1+a+b+c+ab+bc+ca+abc).

26. If a+b+c=0, Prove that $a^4 + b^4 + c^4 = 2\left(b^2c^2 + c^2a^2 + a^2b^2\right)$

27. Find the percentage increase in the area of the triangle if its each side is doubled.
28. Answer the following
    (i). If a point C lies between two points A and B such that AC = BC, then prove that AC = ½ AB. Explain by drawing the figure.
    (ii) Point C is called a mid-point of line segment AB. Prove that every line segment has one and only one mid-point. Lines
29. OA=OB, OC=OD & ∠AOB=∠COD. Prove that AC=BD



30. Prove that sum of three altitudes of a triangle is less than the three sides of triangle.

Please send your querries at
vishvas_1@ymail.com
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VISHVAS TUTORIALS LUDHIANA
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