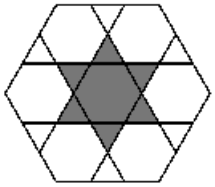
JMC Geometry

1. In rectangle $PQRS$, the ratio of $\angle PSQ$ to $\angle PQS$ is $1:5$. What is the size of $\angle QSR$?

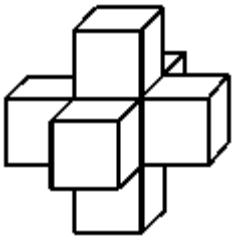
   A $15°$ B $18°$ C $45°$ D $72°$ E $75°$

2. The diagram shows a design formed by drawing six lines in a regular hexagon. The lines divide each edge of the hexagon into three equal parts. What fraction of the hexagon is shaded?



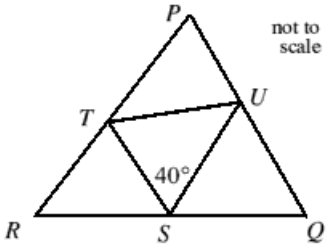
   A $\frac{1}{5}$ B $\frac{2}{9}$ C $\frac{1}{4}$ D $\frac{3}{10}$ E $\frac{5}{16}$

3. One cube has each of its faces covered by one face of an identical cube, making a solid as shown. The volume of the solid is $875cm^3$. What, in cm^2, is the surface area of the solid?



   A 750 B 800 C 875 D 900
   E 1050

4. The points S, T, U lie on the sides of the triangle PQR, as shown, so that $QS = QU$ and $RS = RT$.
   $\angle TSU = 40°$. What is the size of $\angle TPU$?

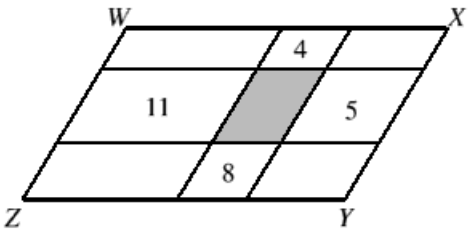


   A $60°$ B $70°$ C $80°$ D $90°$ E $100°$

5. The diagram on the right shows a rhombus $FGHI$ and an isosceles triangle FGJ in which $GF = GJ$. Angle $FJI = 111°$. What is the size of angle JFI?

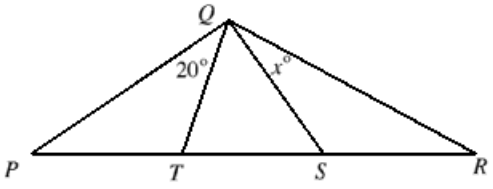
   A $27°$ B $29°$ C $31°$ D $33°$ E $34\frac{1}{2}°$

6. The parallelogram $WXYZ$ shown in the diagram on the right has been divided into nine smaller parallelograms. The perimeters, in centimetres, of four of the smaller parallelograms are shown. The perimeter of $WXYZ$ is 21cm. What is the perimeter of the shaded parallelogram?



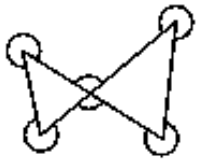
   A 5cm B 6cm C 7cm D 8cm E 9cm

7. In the diagram on the right, $PT = QT = TS$, $QS = SR$, $\angle PQT = 20°$. What is the value of x?



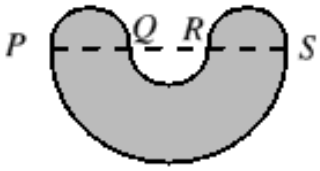
   A 20 B 25 C 30 D 35 E 40

8. What is the sum of the six marked angles?



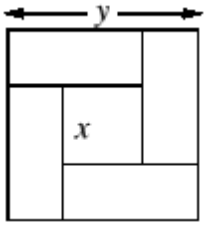
A $1080°$ B $1440°$ C $1620°$ D $1800°$
E more info needed

9. The points P, Q, R, S lie in order along a straight line, with $PQ = QR = RS = 2cm$. Semicircles with diameters PQ, QR, RS and SP join to make the shape shown on the right. What, in cm^2 is the area of the shape?



A 5π B $9\pi/2$ C 4π D $7\pi/2$ E 3π

10. The diagram shows a square with sides of length y divided into a square of length x and four congruent rectangles. What is the length of the longer sides of each rectangle?

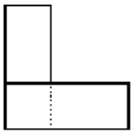


A $\frac{y-x}{2}$ B $\frac{y+2x}{3}$ C $y - x$ D $\frac{2y}{3}$ E $\frac{y+x}{2}$

11. The diagram shows an equilateral triangle with its corners at the mid-points of alternate sides of a regular hexagon. What fraction of the area of the hexagon is shaded?

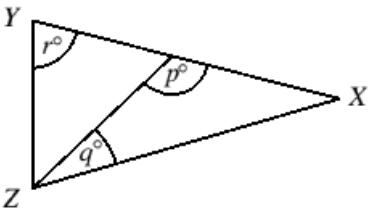
A $\frac{1}{2}$ B $\frac{1}{3}$ C $\frac{3}{8}$ D $\frac{4}{9}$ E $\frac{7}{12}$

12. Two identical rectangular cards are glued together as shown to form an 'L' shape. The perimeter of this 'L' shape is 40cm. What is the ratio of the lengths of the sides of one of the original cards?



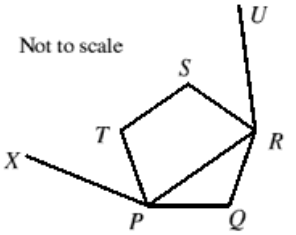
A 1:2 B 1:4 C 1:5 D 2:5 E more information required

13. In the diagram, triangle XYZ is isosceles, with $XY = XZ$. What is the value of r in terms of p and q?



A $\frac{1}{2}(p-q)$ B $\frac{1}{2}(p+q)$ C $p - q$
D $p + q$ E Impossible to determine

14. The figure shows a regular pentagon $PQRST$ together with three sides XP, PR, RU of a regular hexagon with vertices $PRUVWX$. What is the size of angle SRU?



A $48°$ B $54°$ C $60°$ D $63°$ E $72°$

Solutions

1. E
2. B
3. A
4. E
5. A
6. C
7. D
8. B
9. A
10. E
11. C
12. E
13. B
14. A