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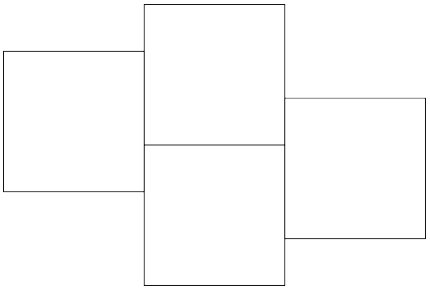
SPRING 2014 *mila@nymathcircle.org*

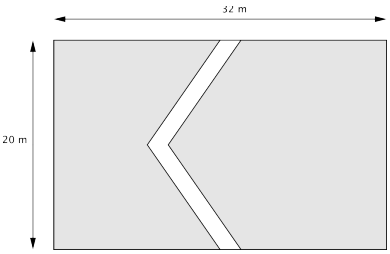
Challenging Geometry Problems for Lower Middle School Students

Rectangles, Triangles, and Circles

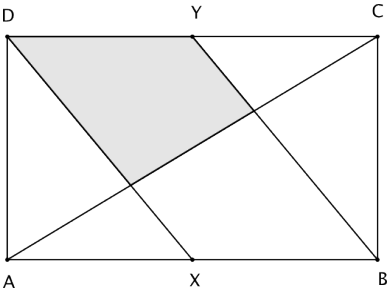
1. The figure below is made up or 3-cm squares. What is the perimeter of the figure?



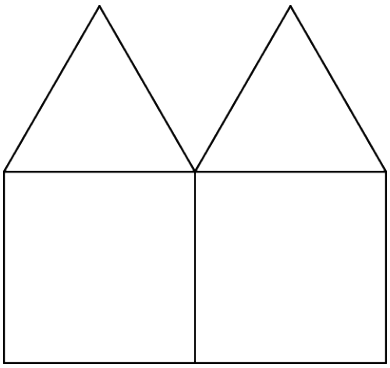
2. The figure shows a rectangular field with a walking path of width 2 m. Find the total area of the field.



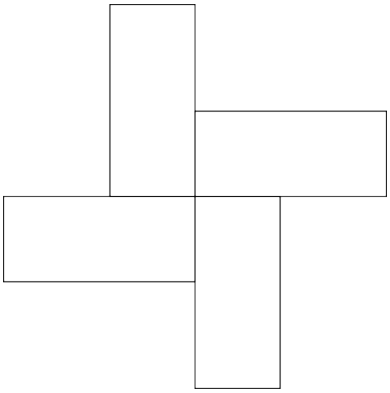
3. The figure below shows a rectangle ABCD. The midpoints of AB and CD are points X and Y respectively. What fraction of the rectangle is shaded?



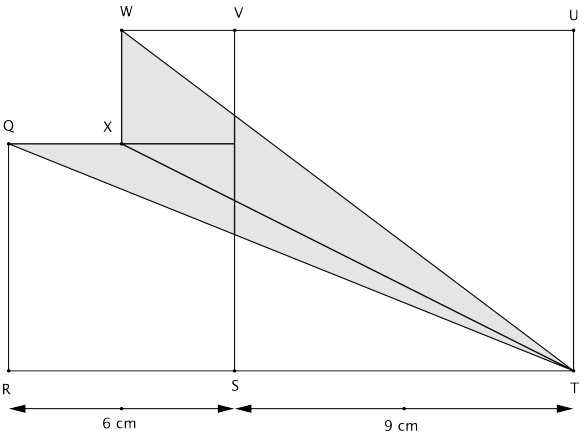
4. The figure is made up of 2 identical squares and 2 identical equilateral triangles. The perimeter of the figure is 192 cm. What is the length of the square?



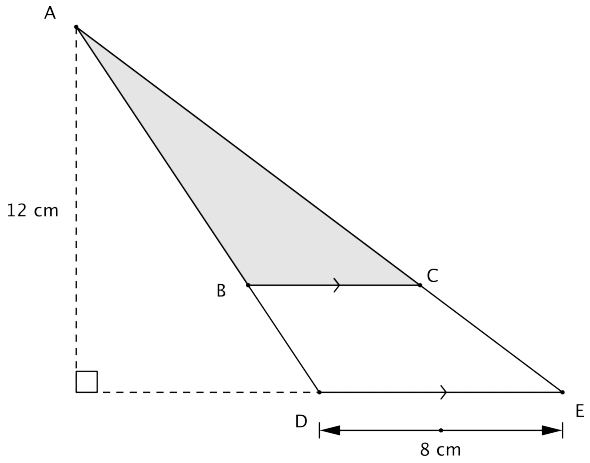
5. The figure is made up of 4 identical rectangles each measuring 27 cm by 12 cm. Find the perimeter of the figure.



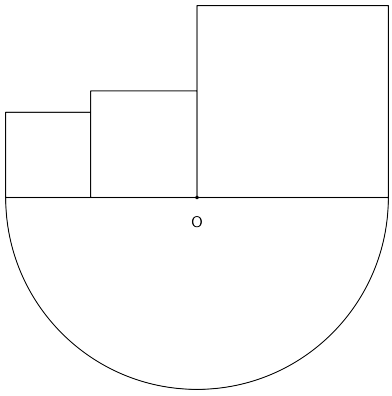
6. The figure is made up of squares of different sizes. Find the area of the shaded part.



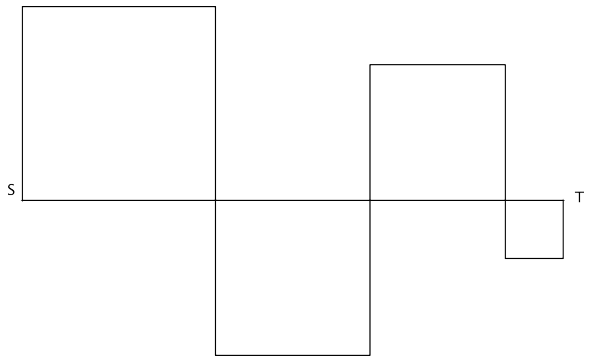
7. The area of triangle ADE is twice the area of triangle ABC. Find the area of triangle ABC.



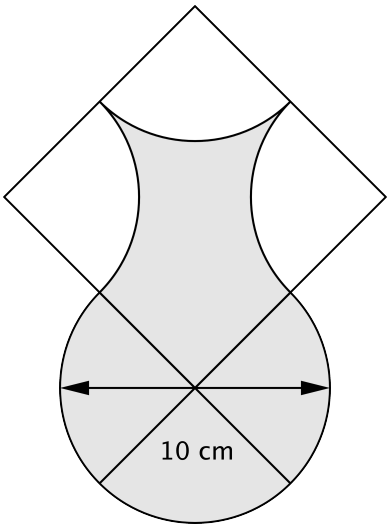
8. The figure below is made up of 3 squares and a semicircle of diameter 36 cm. **O** is the center of the semicircle. Find the perimeter of the figure.



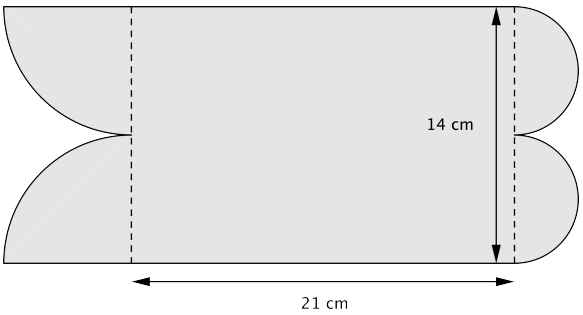
9. Joe had a piece of wire 3.2 m long He used it to make a design of 4 squares as shown below. Find the length of ST.



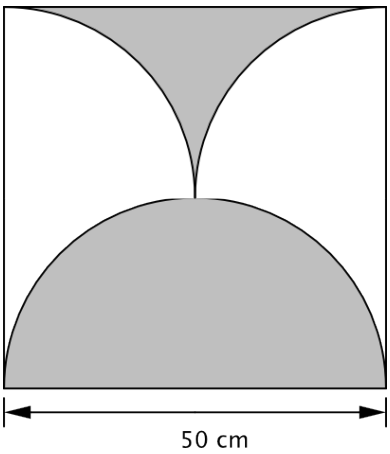
10. The figure below is made up of a square and three quarter circles. What is the area of the shaded part?



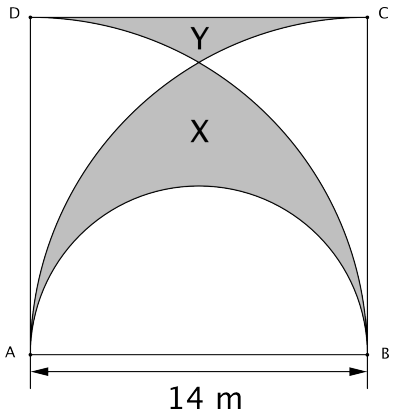
11. The figure below shows two quarter circles and two semicircles at the sides of a rectangle. The length of the rectangle is 21 cm. Its width is 14 cm. Find the area and perimeter of the figure. (Take $\pi \approx \frac{22}{7}$)



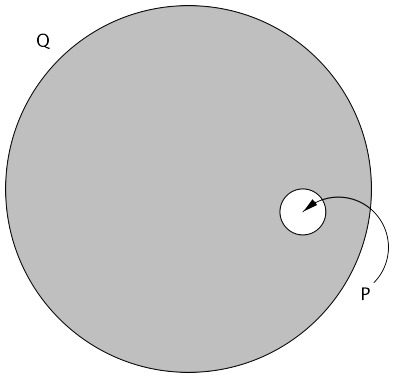
12. The figure below shows a square of side 50 cm. What is the total area of the shaded parts?



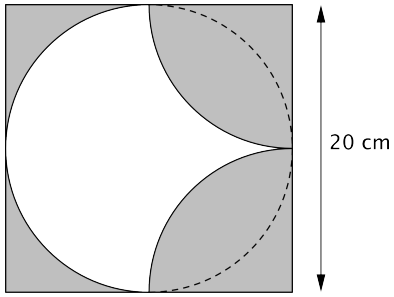
13. The figure below shows a semicircle of diameter 14 m and two quarter circles, ABC and ABD, in a square. Find the difference between the area of the shaded part X and the shaded part Y. (Take $\pi \approx \frac{22}{7}$)



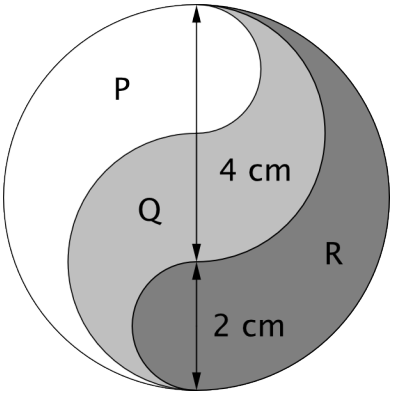
14. The ratio of the diameter of the circle P to the diameter of circle Q is 1 : 8. The area of the shaded part is 9702cm^2. What is the difference in the circumference of the two circles? (Take $\pi \approx \frac{22}{7}$)



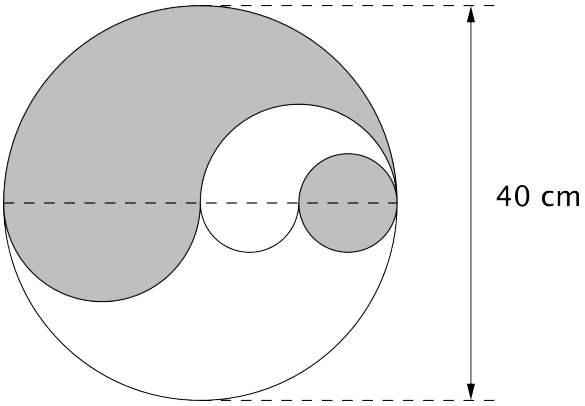
15. The figure shows a square, a circle, and two identical quadrants. Find the area of the shaded region.



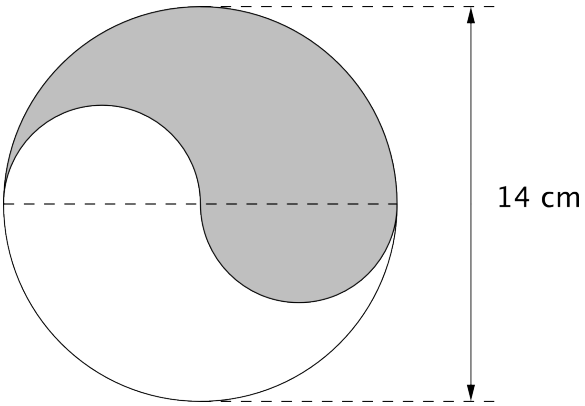
16. The figure below shows a circle of diameter 6 cm, two semicircles of diameter 4 cm, and two semicircles of diameter 2 cm. Find the ration of the area of region P to the area of region Q to the area of region R.



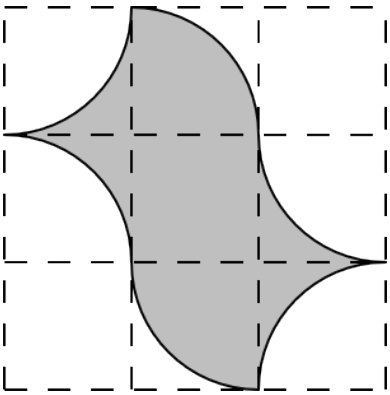
17. The figure shows a big circle, 2 identical semicircles and 3 identical smaller semicircles. The diameter of the big circle is 40 cm. Find the total area of the shaded parts.



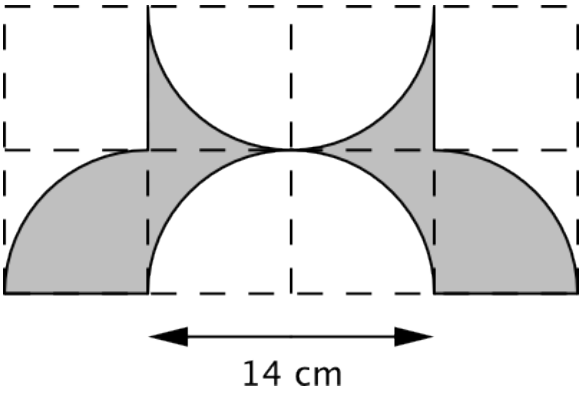
18. The figure shows a circle of diameter 14 cm and two identical semicircles. Find the area of the shaded region. (Take $\pi \approx \frac{22}{7}$)



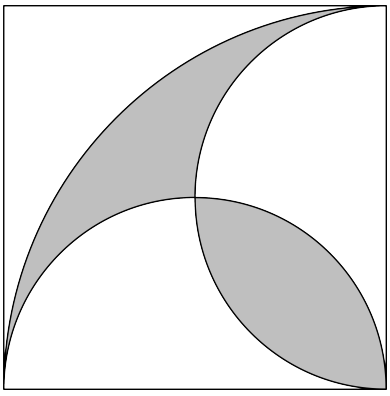
19. The figure is made up of identical squares and quarter circles. Find the area of the figure.



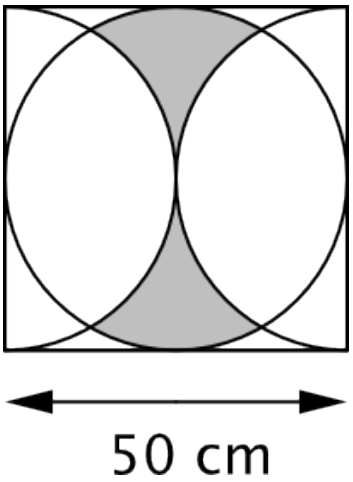
20. The figure is made up of identical squares are quarter circles. Find the area of the figure. (Take $\pi \approx \frac{22}{7}$)



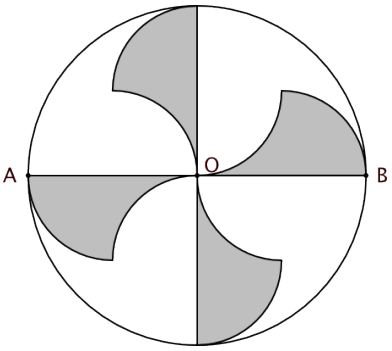
21. The figure shows a quarter circle of radius 40 cm and two identical semicircles. Find the total shaded area of the figure.



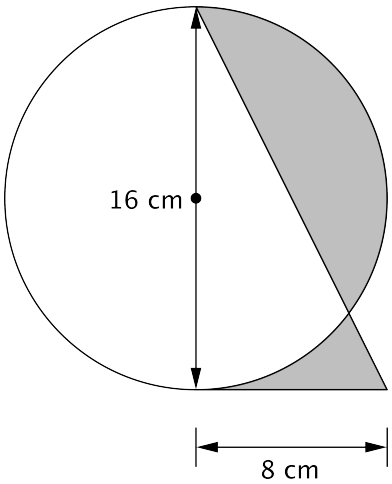
22. The figure below is made up of a square, a circle and 2 identical semicircles. Find the perimeter of the shaded parts in the figure below.



23. The figure shows a big circle and eight identical quarter arcs. Point **O** is the center of the circle, and the diameter AB is 20 cm long. Find the total area and the perimeter of the shaded parts of the figure.



24. Find the difference between the two shaded areas.



BIBLIOGRAPHY

Wan, Ammiel. Visible Thinking in Mathematics Washington, Marshall Cavendish, 2011

Yoong, Wong Khoon New Elementary Mathematics Syllabus D, Marshall Cavendish, 1996

Fanglan, Li Process Skills in Problem Solving Level 6, FAN-Math Education

Challenging Word Problems 5, Primary Mathematics, Marshall Cavendish, 2011

Challenging Word Problems 6, Primary Mathematics, Marshall Cavendish, 2011