

# More rotational symmetry

Find the total number of rotational symmetries for each the Mathomat V7 template shapes shown below. Write your answers in the space provided.

**MATHOMAT™ V7**  
www.mathomat.com.au

Start by tracing the shapes onto scrap paper and cutting them out; rotate each shape with a pen holding the shape at its centre and note the number of times the shape returns to its original shape during one complete rotation.

With practice you can learn to find rotational symmetries in your head, sometimes by creating a mental picture of the shape and rotating it in your imagination, or possibly by using logic, such as the following:

A regular pentagon has 5 equal sides and 5 equal angles, so it will have 5 rotational symmetries to return to its starting position. It must rotate through 360 degrees so each rotation must be an angle of  $(360/5) = 72$  degrees.

Shapes shown include: 1. Tangram units, 2. Dodecagon, 3. Octagon, 4. Hexagon, 5. Triangle, 6. Hexagon, 7. Hexagon, 8. Decagon, 9. Archibuilder, 10. Archibuilder, 11. Tessel's geometry box, 12. Pentagon, 13. Pentagon, 14. Square, 15. 10x40mm, 16. Triangle, 17. Rectangle, 18. 100 Divisions (Percentage points) 50mm, 19. Circle, 20. Sector  $\theta=1$  radian, 21. Rhombus  $60^\circ$ , 22. Tangram, 23. Rhombus  $90^\circ$ , 24. Circle, 25. Square, 26. Oval, 27. Kite, 28. Rhombus  $45^\circ$ , 29. Circle, 30. Square, 31. Trapezium, 32. Trapezium, 33. Triangle, 34. Triangle, 35. Triangle, 36. Triangle, 37. Triangle, 38. Scalene, 39. Oval, 40. Parallelogram, 41. Triangle, 42. Triangle, 43. Oval, 44. Triangle, 45. Circle, 46. Circle.

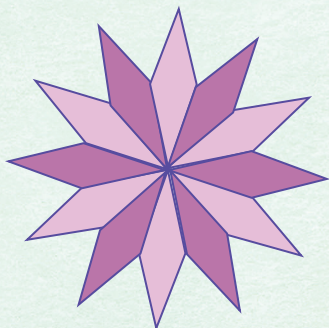
Mathematical scales include: Linear Radian Scale (1 Radian = 1.5cm), Archibuilder (0 to 13), Radians (0 to 2π), Percentage points (0 to 100), and Number Line - cm divisions (0 to 10).

Scale 1:2 Scale 1:2000 mapping and street directory

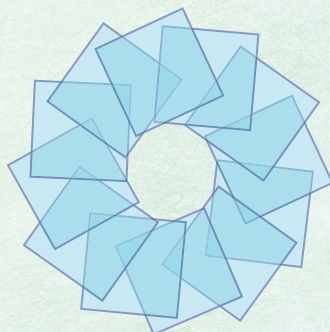
Name: .....

# Symmetry of interesting shapes

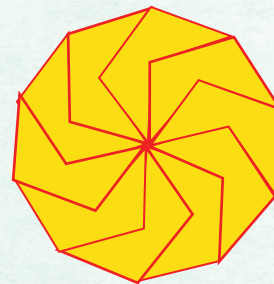
For each of the objects below find its total number of rotational symmetries and record them in the boxes marked R. Use Mathomat V7 to help.



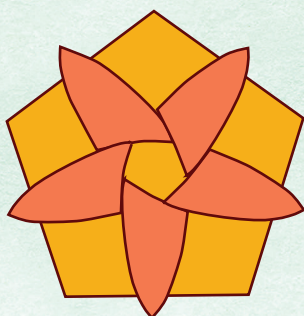
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R	L



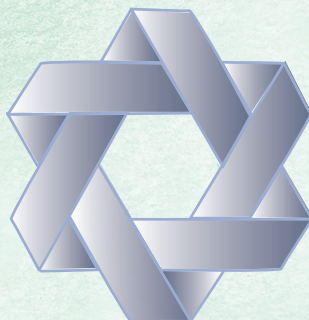
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R	L



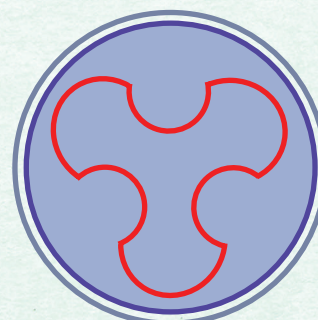
<input type="text"/>	<input type="text"/>
R	L



<input type="text"/>	<input type="text"/>
R	L



<input type="text"/>	<input type="text"/>
R	L



<input type="text"/>	<input type="text"/>
R	L

Real life objects (which may not be perfect).



<input type="text"/>	<input type="text"/>
R	L



<input type="text"/>	<input type="text"/>
R	L



<input type="text"/>	<input type="text"/>
R	L

All these objects may also have line symmetry. Find the total number of lines of symmetry in each image, marking them using your Mathomat, then record your answers in the boxes marked L.