

Max's Geometry Garden Challenge

Learning objective: To identify, compare, and order angles up to two right angles, and identify lines of symmetry in 2D shapes.

Help Max the monkey organize his botanical garden. Read the passage carefully and use your knowledge of geometry to solve the puzzles below. Show your workings clearly.

Max is designing a beautiful garden. He wants to plant his favorite flowers in specific shapes. He has a square flowerbed with four right angles and four lines of symmetry. Nearby, he has a triangular patch that features one obtuse angle and two acute angles. Max is currently measuring the path edges; he has noticed that two paths run perfectly parallel to each other, never meeting, while another path meets them at a perpendicular angle, creating a perfect L-shape. Max needs to make sure all his garden decorations are placed accurately to ensure the symmetry remains perfect.

Word bank: acute · obtuse · right angle · symmetry · vertex · parallel · perpendicular · horizontal

1. Max has a triangular flowerbed with one obtuse angle and two acute angles. Explain why this triangle cannot have a line of symmetry if all three sides are of different lengths. Justify your answer. (2 marks)

2. Identify two shapes mentioned in the text that contain at least one right angle. Compare the number of vertices in these two shapes. (2 marks)

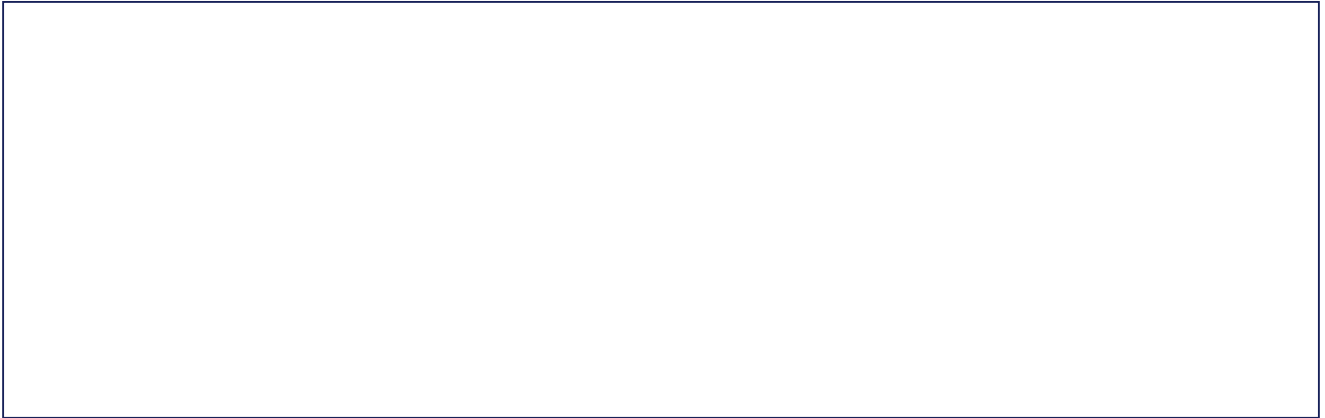
3. Max wants to add a new hexagonal birdbath. How many lines of symmetry might a regular hexagon have? Explain your reasoning. (2 marks)

4. If Max draws a line that is perpendicular to a horizontal path, what angle is created at the intersection? Draw or describe the relationship between these two lines. (2 marks)

5. What might happen to the symmetry of Max's square flowerbed if he decided to extend one side, making it a rectangle? Compare the properties of a square and a rectangle. (2 marks)

6. Max found a leaf shaped like an irregular pentagon. Does an irregular shape always have zero lines of symmetry? Explain why or why not. (2 marks)

Draw: Draw a bird's-eye view of Max's garden. Include one shape with an obtuse angle, one shape with parallel lines, and one shape that has at least two lines of symmetry. Label each geometric feature clearly.



Extension challenge: Design a complex 'Geometric Maze' for Max. Your maze must include a variety of polygons. For each polygon used, list the number of right angles, acute angles, and obtuse angles it contains. Challenge a partner to identify the parallel and perpendicular lines within your design.