

Introduction to Polygons

Name: _____

Date: _____

Example 1. Define the following terms and draw a picture of each one.

- Shape
- Polygon
- Corner
- Side
- Diagonal

- Triangle
- Quadrilateral
- Pentagon
- Hexagon
- Heptagon
- Octagon

- Acute triangle
- Right triangle
- Obtuse triangle
- Equilateral triangle
- Isosceles triangle
- Scalene triangle

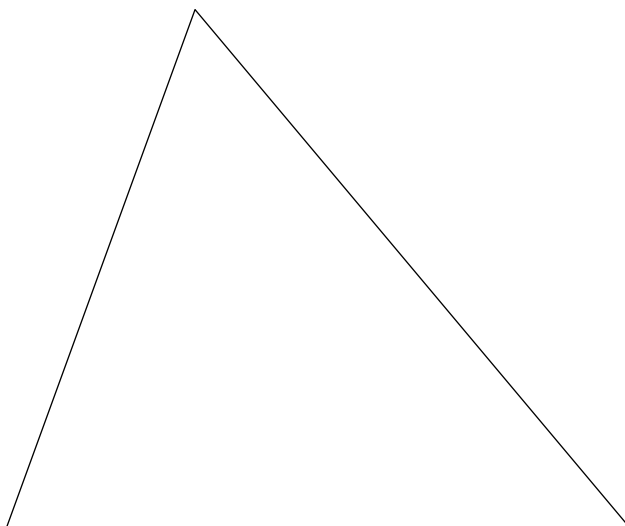
- Square
- Rhombus
- Rectangle
- Trapezoid
- Parallelogram

Example 2. For each criterion below, draw an example of a shape that satisfies it, or explain why no such polygon exists.

- A polygon with more corners than sides
- A polygon with more sides than corners
- A triangle that is both right and isosceles
- A triangle that is both acute and scalene
- A triangle that is both obtuse and equilateral
- A triangle with exactly two right angles

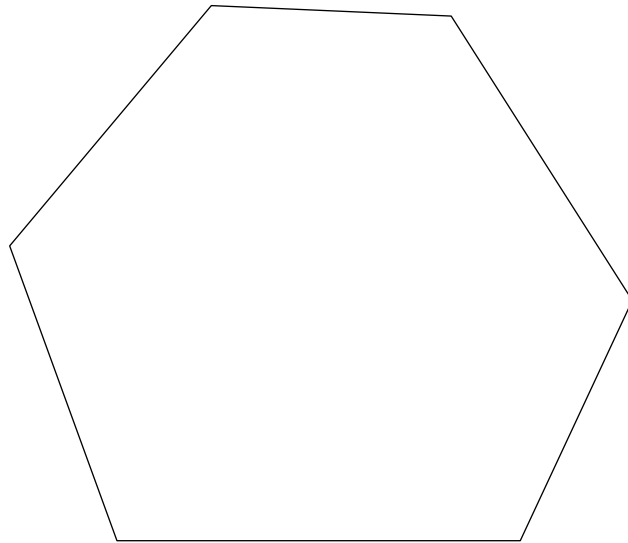
- A quadrilateral with exactly two right angles
- A quadrilateral with exactly three right angles
- A hexagon whose angles are all equal but whose sides are not all equal

Example 3. Explain why the three angles in a triangle always sum to 180° .



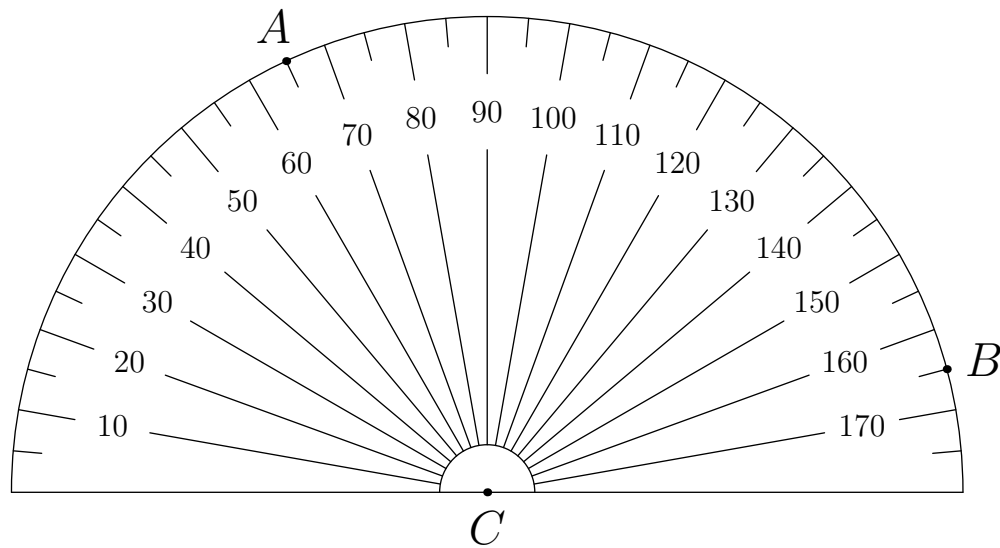
Example 4. An isosceles triangle has a 42° angle. What are the possible values for the degree measures of the other two angles?

Example 5. How many diagonals does a hexagon have?

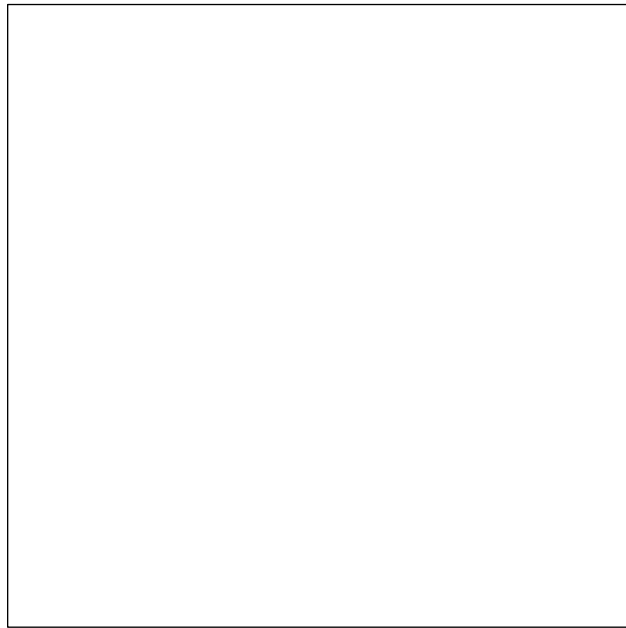


Example 6. Is it possible to glue two hexagons along their edges to form a triangle? Explain why or why not.

Problem 1. Without using a protractor, find the degree measure of $\angle ABC$.



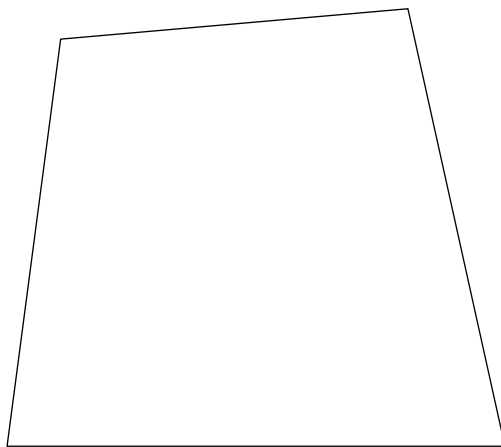
Problem 2. What is the degree measure of the angle formed by the two diagonals of a square?



Problem 3. The largest angle in a right triangle is 36° larger than the smallest angle in a triangle. What is the degree measure of the second largest angle in the triangle?

Problem 4. One angle of an isosceles triangle is 30° more than another angle. There are two possible values for the degree measure of the largest angle of the triangle. What are those two values?

Problem 5. Do the degree measures of the angles in a quadrilateral always add up to the same number? Explain why or why not.



Problem 6. A *decagon* is a polygon with ten sides. How many diagonals does a decagon have?

