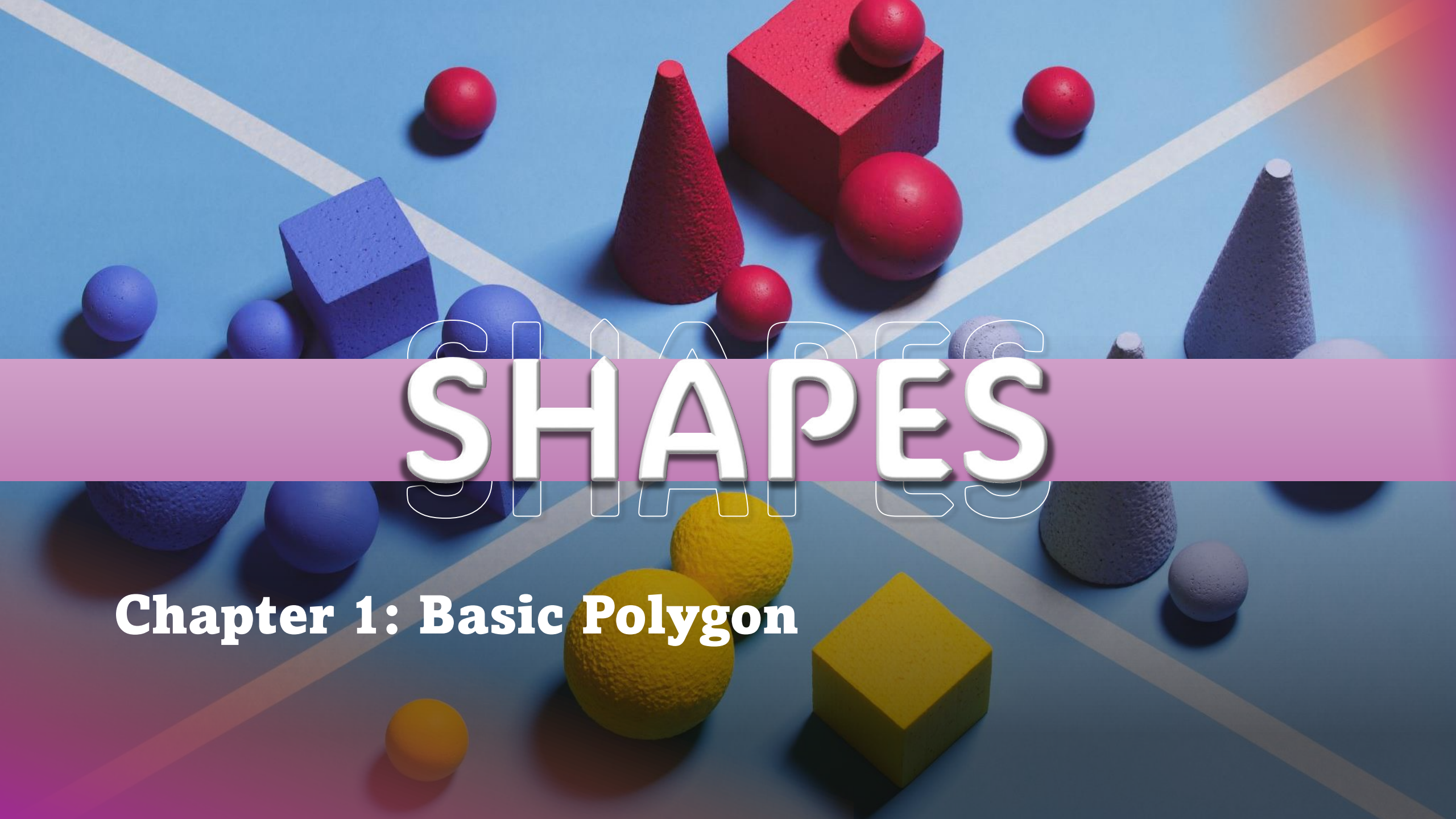
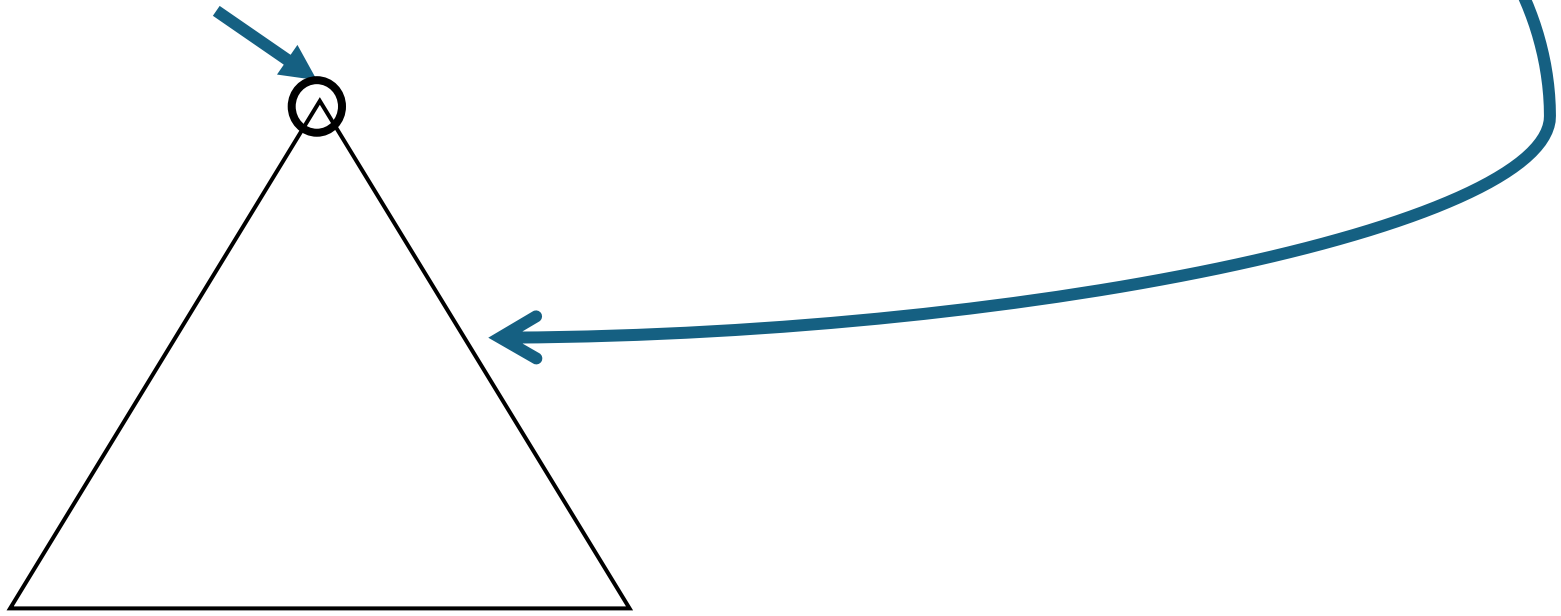


Chapter 1: Basic Polygon

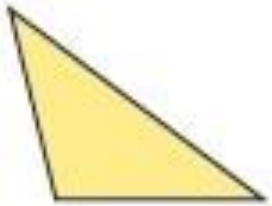
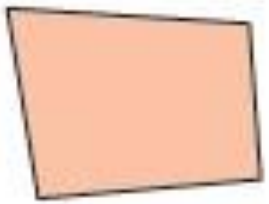
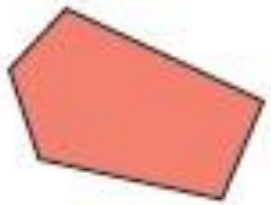
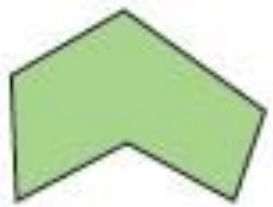
Basic Polygon

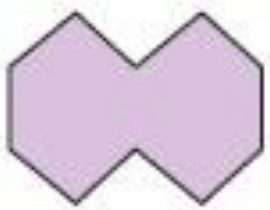
Definition:

A closed figure on a plane made out of line segment, called **sides**, that meet up points called **verticles**. A polygon at least has 3 sides.



Basic Polygon

Name of polygon	 Triangle	 Quadrilateral	 Pentagon	 Hexagon
Number of sides	3	4	5	6

Name of polygon	 Heptagon	 Octagon	 Nonagon	 Decagon
Number of sides	7	8	9	10

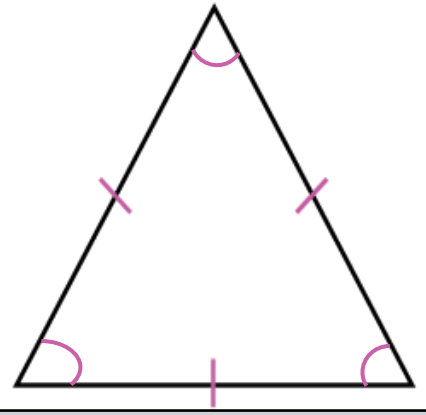
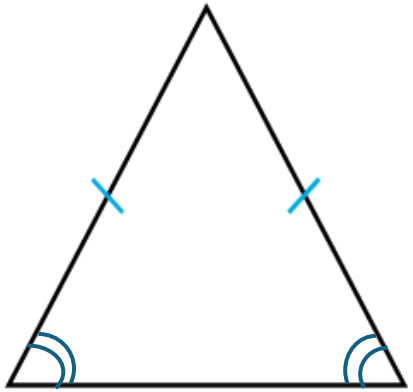
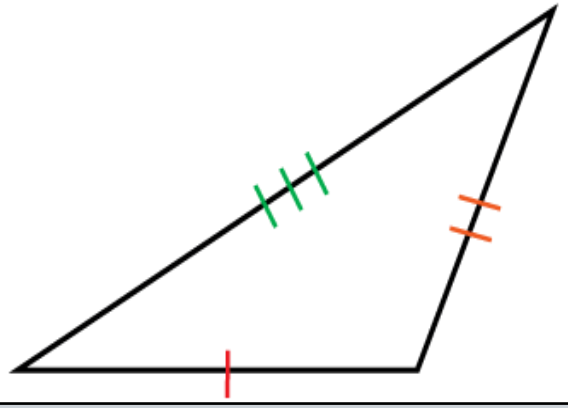
Properties of Triangle

Triangle can be classified according to these aspects:

- Geometries properties of their sides
  (The length of the sides)
- Geometries properties of their angles
  (Interior Angles)

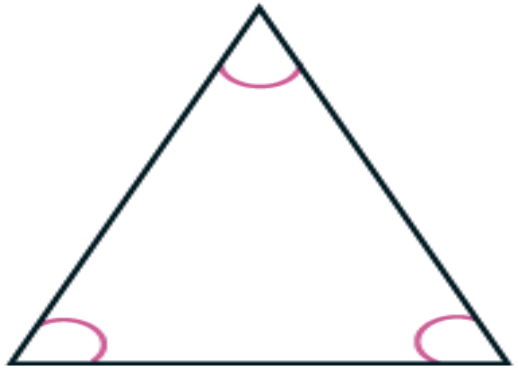
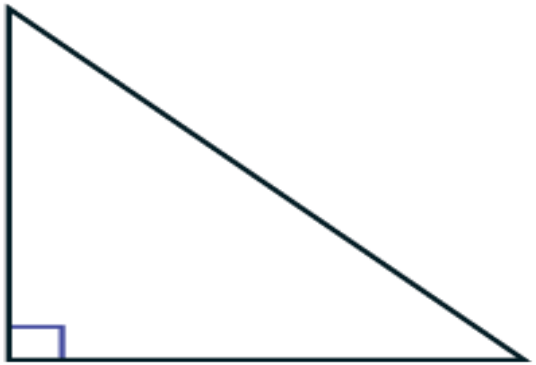
Properties of Triangle

Classifications – Length of the sides

		
Equilateral	**Isoceles**	**Scalene**
• All sides have the same length • Every interior angle is 60°	• Two sides have the same length • The two base angles have the same size	• All sides have the different length • All interior angles are of different sizes

Properties of Triangle

Classifications – Interior Angles

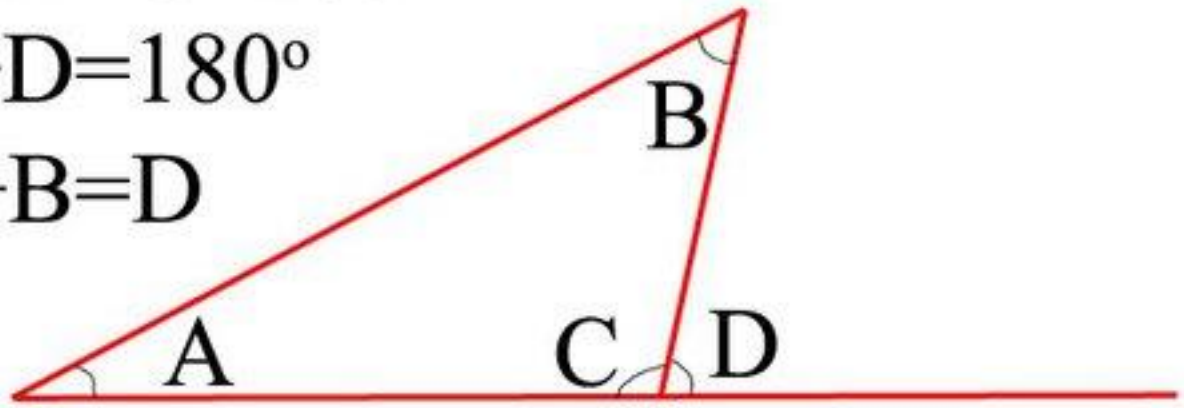
		
Acute-Angled	**Right-Angled**	**Obtuse-Angled**
• Every interior angle is an acute angle (< 90°)	• One of the interior angle is a right angle (90°)	• One of the interior angle is an obtuse angle (> 90°)

Interior + Outerior Angles of Triangle

$A+B+C=180^{o}$

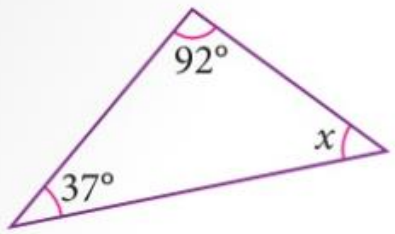
$C+D=180^{o}$

$A+B=D$

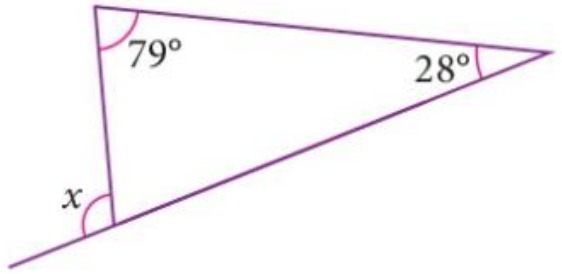


Interior + Outerior Angles of Triangle

(a)



(b)



Solution

(a) $92° + 37° + x = 180°$ ← The sum of all the interior angles is 180°.

$129° + x = 180°$

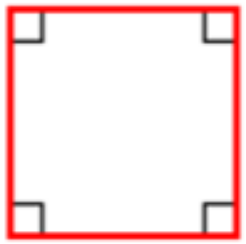
$x = 180° - 129°$

$= 51°$

(b) $x = 79° + 28°$ ← The exterior angle is the sum of two opposite interior angles.

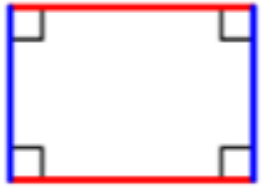
$= 107°$

Properties of Quadrilaterals



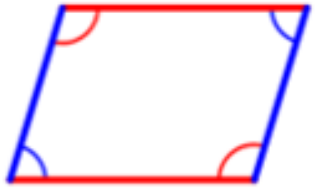
square

All sides equal
All angles 90°



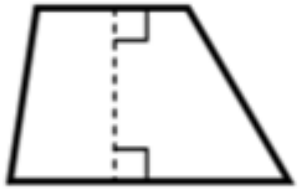
rectangle

Opposite sides equal
All angles 90°



parallelogram

Opposite sides equal
and parallel

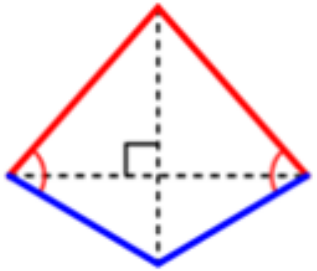


trapezoid (US)
trapezium (UK)

At least 1 pair of
parallel sides

rhombus

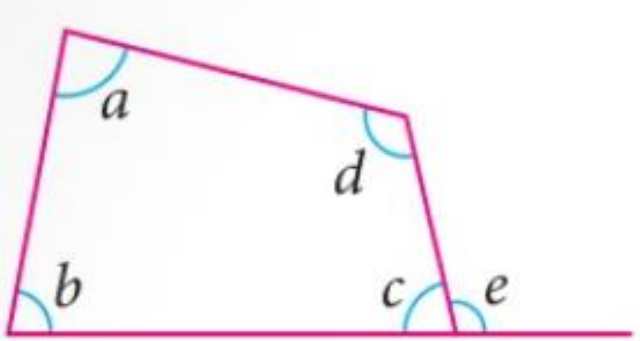
All sides equal
Opposite sides parallel



kite

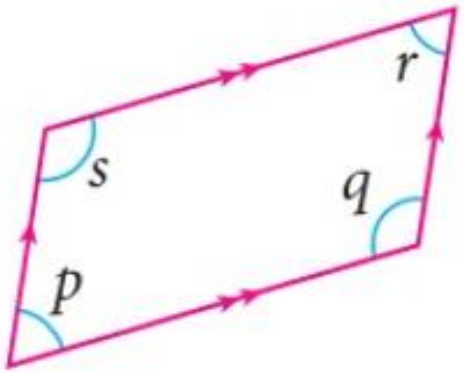
Adjacent pairs of
sides equal

Interior + Outerior Angles of Quadrilaterals



$$a + b + c + d = 360°$$

$$c + e = 180°$$

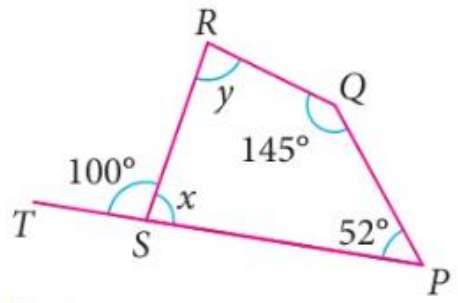


$$p = r$$

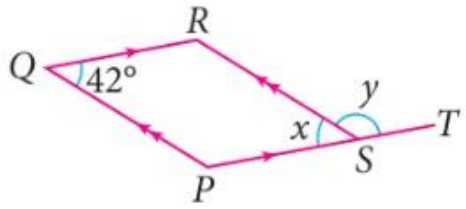
$$q = s$$

Interior + Outerior Angles of Quadrilaterals

(a)



(b)



Solution

(a) $x + 100° = 180°$ ← Sum of the interior angle and its adjacent exterior angle is 180°.

$x = 180° - 100°$

$= 80°$

$y + 80° + 52° + 145° = 360°$ ← Sum of the interior angles of a quadrilateral is 360°.

$y + 277° = 360°$

$y = 360° - 277°$

$= 83°$

(b) $x = 42°$ ← Opposite angles in a parallelogram are equal.

$y + 42° = 180°$

$y = 180° - 42°$

$= 138°$