

Walt solve angles involving triangles and polygons

Success Criteria

- I can identify different types of triangles and polygons.
- I can use the properties of triangles and polygons to find missing angles.
- I can solve problems involving angles in triangles and polygons

Important information

### Triangles

- Equilateral triangle: All three angles are equal.
- Isosceles triangle: Two of the angles are equal.
- Scalene triangle: All three angles are different.

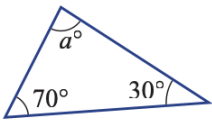
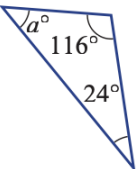
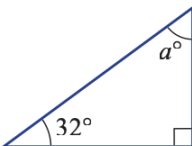
Polygon

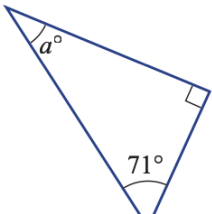
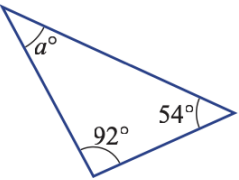
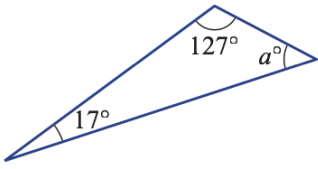
- Square: All four sides are equal and all four angles are right angles.
- Rectangle: All four sides are parallel and all four angles are right angles.
- Rhombus: All four sides are equal, but the angles are not necessarily right angles.
- Parallelogram: All opposite sides are parallel, but the angles are not necessarily right angles.
- Trapezoid: One set of parallel sides, but the other set of sides may or may not be parallel.
- Regular polygon: All sides are equal and all angles are equal.

Important formula


**Sum of angles =  $(n-2)*180$**

**4** Use the angle sum of a triangle to help find the unknown angle in these triangles.

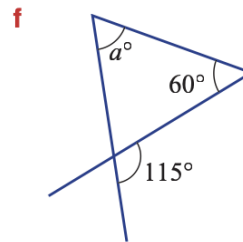
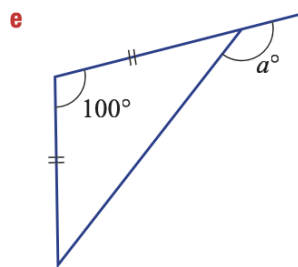
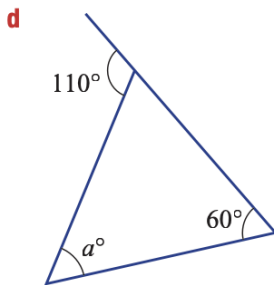
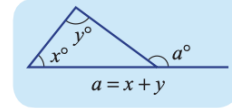
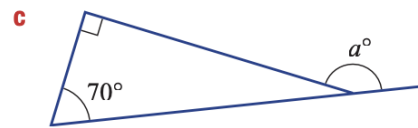
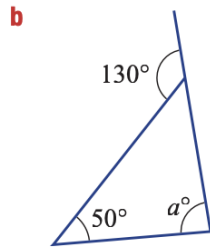
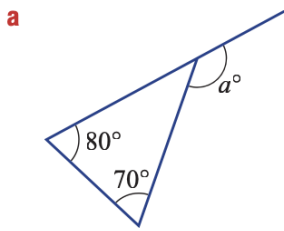
**a**  **b**  **c** 

**d**  **e**  **f** 

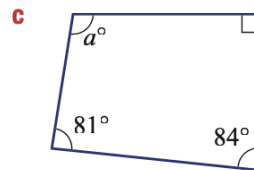
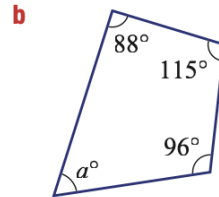
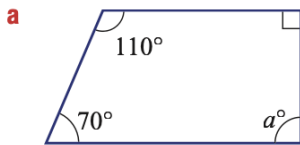
For each one start with an equation like  $a + 36 + 48 = 180$ . Then find the value of  $a$ .



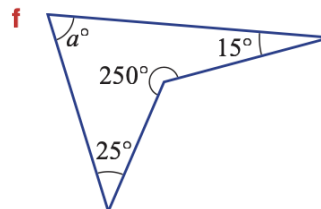
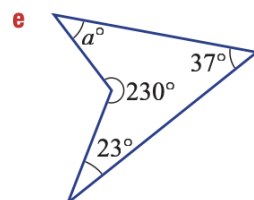
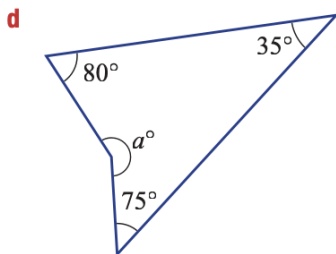
6 Find the value of  $a$ .



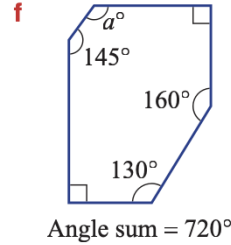
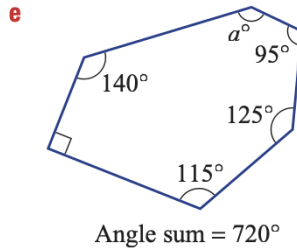
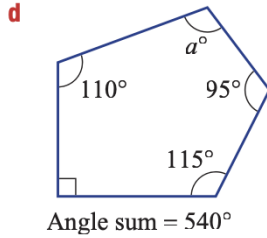
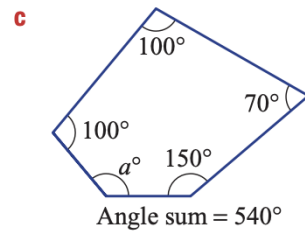
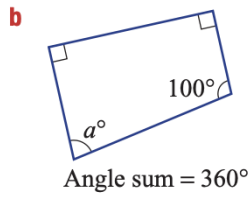
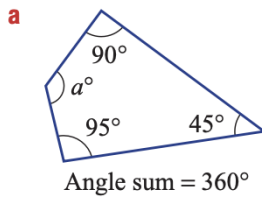
4 Use the quadrilateral angle sum to find the value of  $a$  in these quadrilaterals.



$\perp$  is a  $90^\circ$  angle. The angle sum of a quadrilateral is  $360^\circ$ .



**6** Find the value of  $a$  in these polygons, by using the given angle sum.



Write an equation using the given angle sum, then find the value of  $a$ .

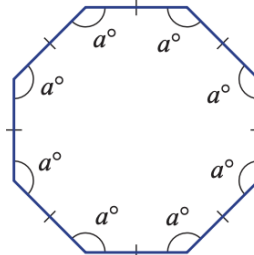
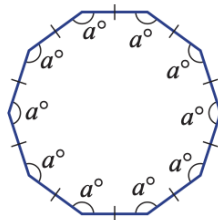
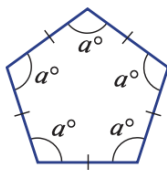


**7** Regular polygons have equal interior angles. Find the size of an interior angle for these regular polygons with the given angle sum.

**a** Pentagon ( $540^\circ$ )

**b** Decagon ( $1440^\circ$ )

**c** Octagon ( $1080^\circ$ )



First find the angle sum then divide by the number of sides.

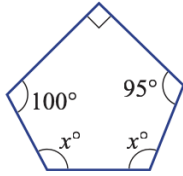


Extension

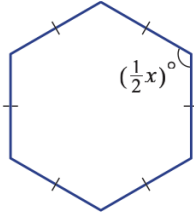
**★ Angle sum challenge**

**13** Find the value of  $x$  in these diagrams.

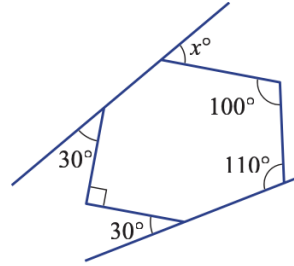
**a**



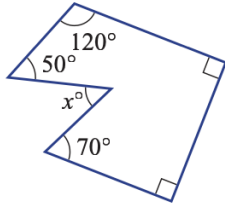
**b**



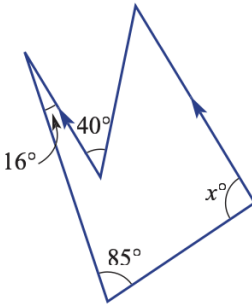
**c**



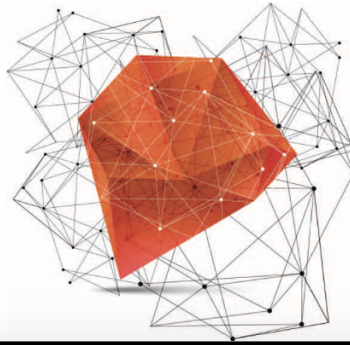
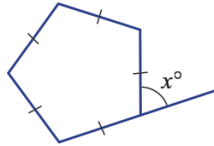
**d**



**e**



**f**



Answers

**4 a** 80

**b** 40

**c** 58

**d** 19

**e** 34

**f** 36

**6 a** 150

**b** 80

**c** 160

**d** 50

**e** 140

**f** 55

Polygon

**4 a** 90

**b** 61

**c** 105

**d** 170

**e** 70

**f** 70

**6 a** square, rhombus

**b** trapezium

**c** rectangle, parallelogram, kite

**d** square, rhombus, kite

**e** square, rectangle

**7 a** 152                      **b** 69                      **c** 145

**d** 74                          **e** 59                      **f** 30

**13 a** 127.5                      **b** 240                      **c** 60

**d** 60                          **e** 79                      **f** 72