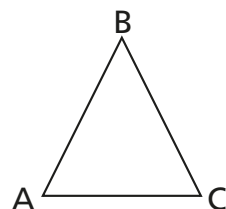


# Calculate missing interior angles in regular polygons

- 1 ABC is an equilateral triangle.



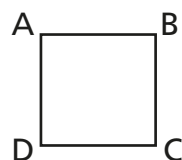
- a) What is the sum of the interior angles of the triangle?
- b) What is the size of each interior angle?
- c) What calculation did you do to work out the size of each interior angle?

180°

60°

180 ÷ 3

- 2 ABCD is a square.



- a) What is the sum of the interior angles of the square?
- b) What is the size of each interior angle?
- c) What calculation did you do to work out the size of each interior angle?

360°

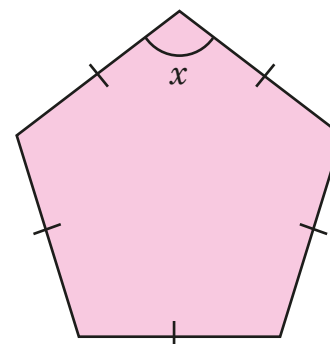
90°

360 ÷ 4

- 3 An equilateral triangle and a square are examples of regular polygons. Describe in your own words what it means for a polygon to be regular.

All sides and angles are equal.

- 4 Work out the size of angle  $x$  in the regular polygons.

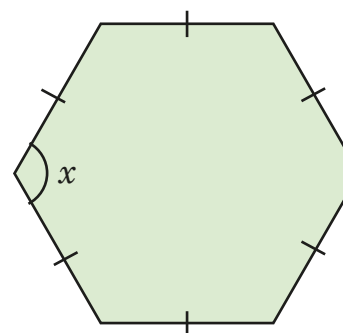


number of sides = 5

sum of interior angles = 540°

$$540 \div 5 = 108$$

$$x = 108^\circ$$

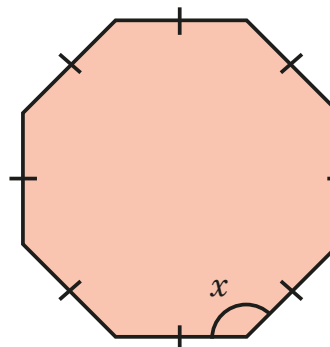


number of sides = 6

sum of interior angles = 720°

$$720 \div 6 = 120$$

$$x = 120^\circ$$

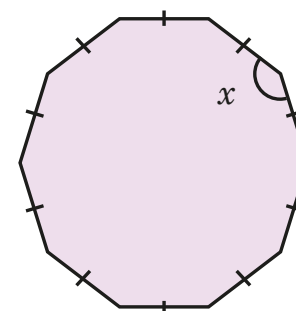


number of sides = 8

sum of interior angles = 1,080°

$$1,080 \div 8 = 135$$

$$x = 135^\circ$$



number of sides = 10

sum of interior angles = 1,440°

$$1,440 \div 10 = 144$$

$$x = 144^\circ$$

5 A regular polygon has 20 sides.

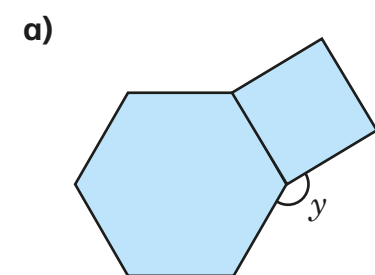
a) Work out the size of each interior angle.

162°

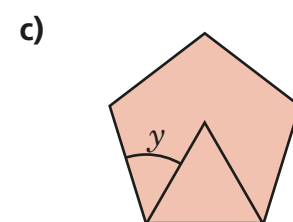
b) Work out the size of each exterior angle.

18°

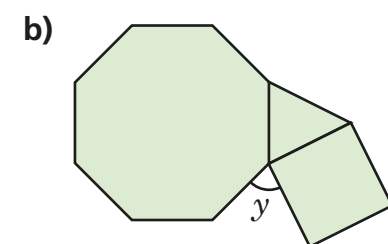
6 Each compound shape is made up of regular polygons.  
Work out the size of angle  $y$  in each case.



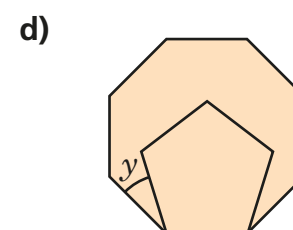
$y = 150^\circ$



$y = 48^\circ$



$y = 75^\circ$

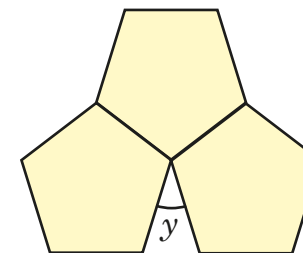


$y = 27^\circ$

7 The pentagons shown are regular.

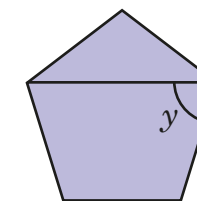
Work out the size of angle  $y$  in each case.

a)



$y = 36^\circ$

b)



$y = 72^\circ$

8 A regular polygon has  $n$  sides.

a) Write an expression for the sum of the angles in the polygon.

$180(n-2)$

b) Write an expression for the size of each interior angle in the polygon.

$\frac{180(n-2)}{n}$

9  $x$  is the exterior angle of a regular polygon.

$y$  is the interior angle of the polygon.

$x:y = 1:8$

How many sides does the polygon have?

18