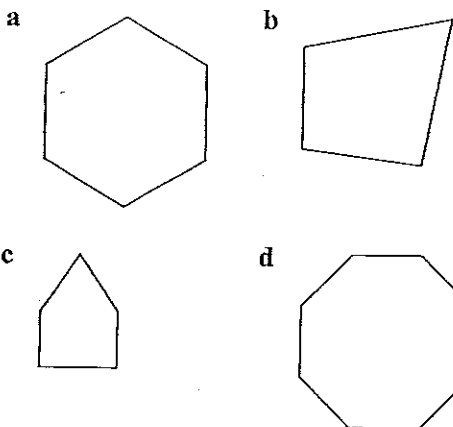


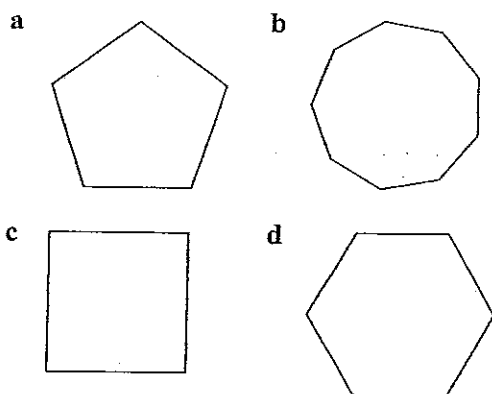
## Worksheet 3-09 Angle sum of a polygon

A polygon with  $n$  sides has an angle sum ( $A$ ) of  $A = 180(n - 2)^\circ$

- 1 Use the formula above to calculate the angle sum of these figures.



- 2 Calculate the angle sum of:
- a a decagon      b a triangle  
c a heptagon      d a dodecagon
- 3 Calculate the angle sum of a polygon with:
- a 16 sides      b 9 sides  
c 21 sides      d 25 sides  
e 100 sides      f 58 sides
- 4 Find the number of sides of the polygon that has an angle sum of:
- a  $900^\circ$       b  $2340^\circ$   
c  $3060^\circ$       d  $6840^\circ$
- 5 a What is the angle sum of a regular octagon?  
b So what is the size of one of these angles?
- 6 Find the size of one angle in each of these regular polygons.

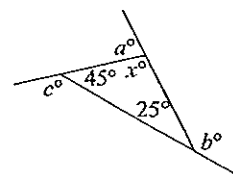


- 7 Calculate the size of one angle in a regular polygon with:

a 12 sides      b 30 sides  
c 15 sides      d 24 sides

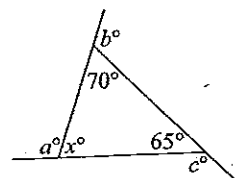
- 8 Find the number of sides of the regular polygon that has equal angles of size:
- a  $140^\circ$       b  $150^\circ$       c  $162^\circ$       d  $170^\circ$

- 9 This triangle has three exterior angles,  $a^\circ$ ,  $b^\circ$  and  $c^\circ$ .

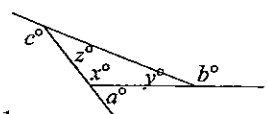


- a Find the values of  $x$ ,  $a$ ,  $b$  and  $c$ .  
b What is  $a + b + c$ , the exterior angle sum of the triangle?

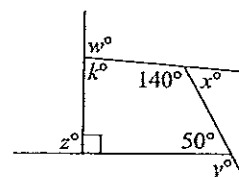
- 10 a Find  $x$ ,  $a$ ,  $b$  and  $c$  for this triangle.  
b What is  $a + b + c$ ?



- 11 a Write a possible value of each of  $x$ ,  $y$  and  $z$ .  
b Hence find  $a$ ,  $b$  and  $c$ .  
c What is  $a + b + c$ ?  
d Complete: The exterior angle sum of any triangle is \_\_\_\_\_.

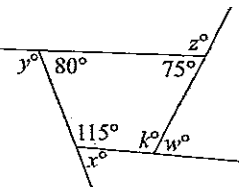


- 12 This quadrilateral has four exterior angles:  $w^\circ$ ,  $x^\circ$ ,  $y^\circ$  and  $z^\circ$ .

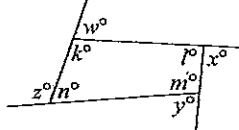


- a Find the values of  $k$ ,  $w$ ,  $x$ ,  $y$  and  $z$ .  
b What is  $w + x + y + z$ , the exterior angle sum of the quadrilateral?

- 13 a Find  $k$ ,  $w$ ,  $x$ ,  $y$  and  $z$ .  
b What is  $w + x + y + z$ ?



- 14 a Write a possible value for each of  $k$ ,  $l$ ,  $m$  and  $n$ .  
b Hence find  $w$ ,  $x$ ,  $y$  and  $z$ .

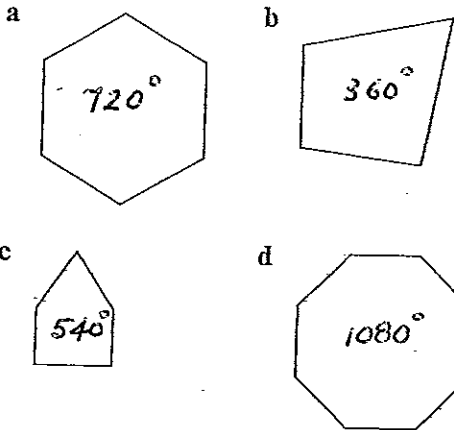


- c What is  $w + x + y + z$ ?  
d Complete: The exterior angle sum of any quadrilateral is \_\_\_\_\_.

# Worksheet 3-09 Angle sum of a polygon

A polygon with  $n$  sides has an angle sum ( $A$ ) of  $A = 180(n - 2)^\circ$

1 Use the formula above to calculate the angle sum of these figures.



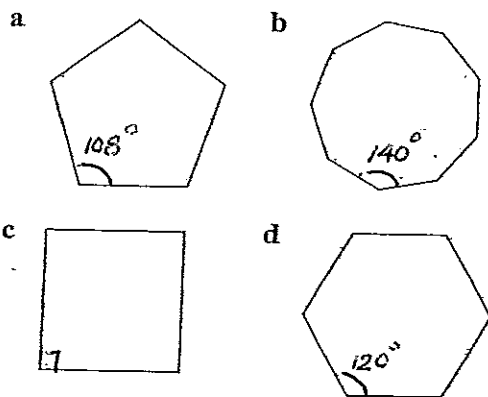
- 2 Calculate the angle sum of:  
 a a decagon  $1440^\circ$  b a triangle  $180^\circ$   
 c a heptagon  $900^\circ$  d a dodecagon  $1800^\circ$
- 3 Calculate the angle sum of a polygon with:  
 a 16 sides  $2520^\circ$  b 9 sides  $1260^\circ$   
 c 21 sides  $3420^\circ$  d 25 sides  $4140^\circ$   
 e 100 sides  $17640^\circ$  f 58 sides  $10080^\circ$

4 Find the number of sides of the polygon that has an angle sum of:

- a  $900^\circ$  7 b  $2340^\circ$  15  
 c  $3060^\circ$  19 d  $6840^\circ$  40

- 5 a What is the angle sum of a regular octagon?  $1080^\circ$   
 b So what is the size of one of these angles?  $135^\circ$

6 Find the size of one angle in each of these regular polygons.



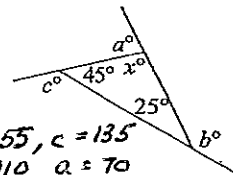
7 Calculate the size of one angle in a regular polygon with:

- a 12 sides  $150^\circ$  b 30 sides  $168^\circ$   
 c 15 sides  $156^\circ$  d 24 sides  $165^\circ$

8 Find the number of sides of the regular polygon that has equal angles of size:

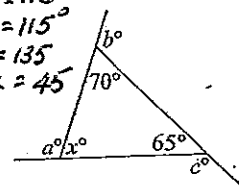
- a  $140^\circ$  9 b  $150^\circ$  12 c  $162^\circ$  20 d  $170^\circ$  36

9 This triangle has three exterior angles,  $a^\circ$ ,  $b^\circ$  and  $c^\circ$ .

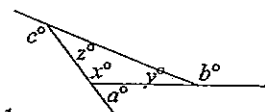


- a Find the values of  $x$ ,  $a$ ,  $b$  and  $c$ .  $b = 155$ ,  $c = 135$   
 $x = 110$   $a = 70$   
 b What is  $a + b + c$ , the exterior angle sum of the triangle?  $360^\circ$

- 10 a Find  $x$ ,  $a$ ,  $b$  and  $c$  for this triangle.  $b = 70$ ,  $c = 115$ ,  $a = 135$   
 b What is  $a + b + c$ ?  $x = 45$ ,  $= 360^\circ$

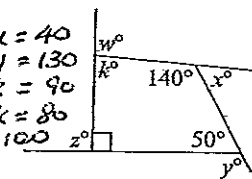


11 a Write a possible value of each of  $x$ ,  $y$  and  $z$ .



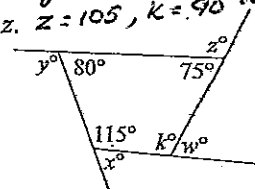
- b Hence find  $a$ ,  $b$  and  $c$ . Tutor to check  
 c What is  $a + b + c$ ?  $= 360$   
 d Complete: The exterior angle sum of any triangle is  $360^\circ$ .

12 This quadrilateral has four exterior angles:  $w^\circ$ ,  $x^\circ$ ,  $y^\circ$  and  $z^\circ$ .

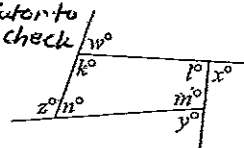


- a Find the values of  $k$ ,  $w$ ,  $x$ ,  $y$  and  $z$ .  $x = 40$ ,  $y = 130$ ,  $z = 90$ ,  $w = 100$   
 b What is  $w + x + y + z$ , the exterior angle sum of the quadrilateral?  $= 360$

- 13 a Find  $k$ ,  $w$ ,  $x$ ,  $y$  and  $z$ .  $y = 100$ ,  $x = 65$ ,  $z = 105$ ,  $k = 90$ ,  $w = 90$   
 b What is  $w + x + y + z$ ?  $= 360$



14 a Write a possible value for each of  $k$ ,  $l$ ,  $m$  and  $n$ . Tutor to check



- b Hence find  $w$ ,  $x$ ,  $y$  and  $z$ .  
 c What is  $w + x + y + z$ ?  $= 360$   
 d Complete: The exterior angle sum of any quadrilateral is  $360^\circ$ .