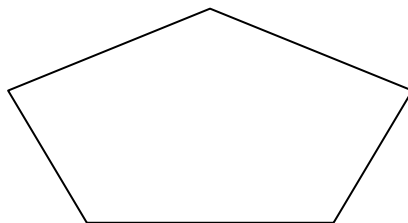


# SAT TOPIC SHEET

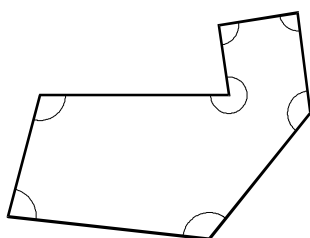
## ANGLES IN POLYGONS

1. What do the angles inside a **pentagon** add up to? Show your working.



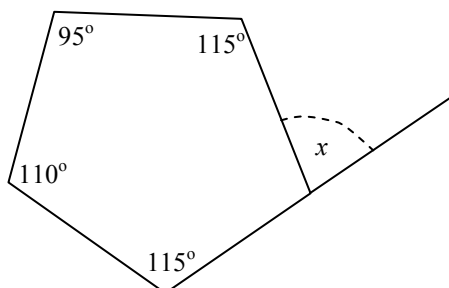
(level 6)

2. What do the angles inside a **heptagon** (7-sided shape) add up to? Show your working.



(level 6)

3. The diagram shows a pentagon.



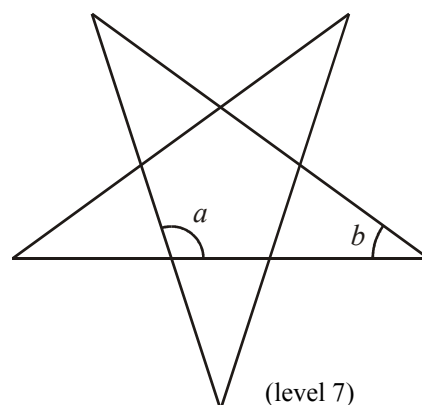
Calculate the size of the **exterior** angle  $x$ .

(level 6)

4. The diagram shows the net for a right-pyramid with a **regular pentagon** as its base.

The net is constructed using five straight lines.

- a) Without measuring, explain why angle  $a$  must be  $108^\circ$ .
- b) Calculate the size of angle  $b$ .



(level 7)

Solutions.

1. Split the pentagon into three triangles to get a total of  $3 \times 180^\circ = 540^\circ$ .
2. Split the heptagon into five triangles to get a total of  $5 \times 180^\circ = 900^\circ$ .
3. Sum of interior angles in **any** pentagon =  $3 \times 180^\circ = 540^\circ$ .  
Four given angles total  $110^\circ + 95^\circ + 115^\circ + 115^\circ = 435^\circ$ .

$$\text{Remaining interior angle} = 540 - 435 = 105^\circ.$$

$$x = 180 - 105 = 75^\circ.$$

4. a) Split the pentagon into three triangles to get that the interior angles total to  $3 \times 180^\circ = 540^\circ$ .  
  
Thus,  $a = 540^\circ \div 5 = 108^\circ$ .
- b)  $180 - 108^\circ = 72^\circ$ .  
 $b = 72^\circ \div 2 = 36^\circ$ .