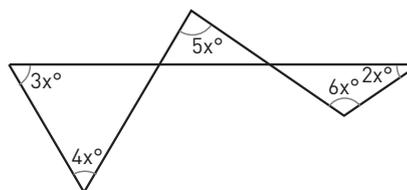
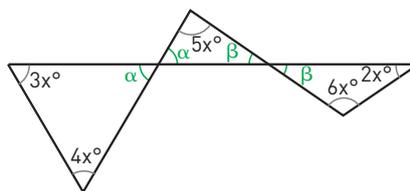


**YOU & MATHS** In the given diagram, what is the value of  $x$ ?

(CAN Canadian Open Mathematics Challenge, COMC, 2001)



Let's call  $\alpha$  and  $\beta$  the remaining angles as shown in figure, remembering that opposite angles are congruent.



We know that in all triangles, the sum of the internal angles is  $180^\circ$ , so:

- $3x^\circ + 4x^\circ + \alpha - 180^\circ$  and therefore  $\alpha - 180^\circ - 7x^\circ$ ;
- $6x^\circ + 2x^\circ + \beta - 180^\circ$  and therefore  $\beta - 180^\circ - 8x^\circ$ .

We also know that:

$$5x^\circ + \alpha + \beta - 180^\circ;$$

and therefore:

$$\alpha + \beta - 180^\circ - 5x^\circ.$$

Substituting the values of  $\alpha$  and  $\beta$  in the above equation, we get:

$$180^\circ - 7x^\circ + 180^\circ - 8x^\circ - 180^\circ - 5x,$$

then:

$$360^\circ - 15x^\circ - 180^\circ - 5x \rightarrow 180^\circ - 10x \rightarrow x = 18.$$