

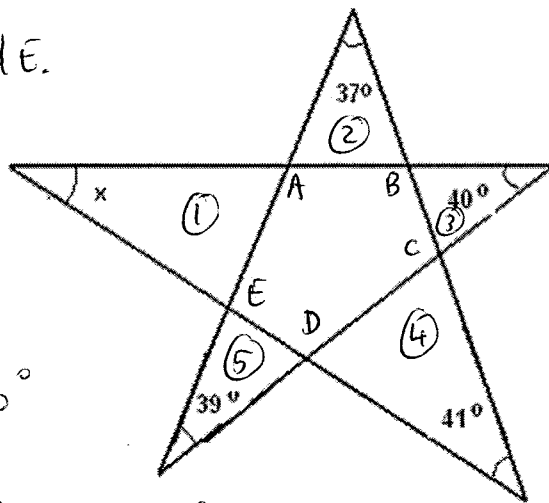
Geometry Worksheet: Angle (3)

Find the measure of angle x.

Method (1)

Label the internal angles of the pentagon as A, B, C, D and E.

We now use each of the five outer triangles to write that the sum of its angles is equal to 180°



$$(1) \Rightarrow x + (180^\circ - A) + (180^\circ - E) = 180^\circ$$

$$(2) \Rightarrow 37^\circ + (180^\circ - A) + (180^\circ - B) = 180^\circ$$

$$(3) \Rightarrow 40^\circ + (180^\circ - B) + (180^\circ - C) = 180^\circ$$

$$(4) \Rightarrow 41^\circ + (180^\circ - C) + (180^\circ - D) = 180^\circ$$

$$(5) \Rightarrow 39^\circ + (180^\circ - D) + (180^\circ - E) = 180^\circ$$

We now add all terms on each side of the equations

Free from www.analyzemath.com

$$(x + 37^\circ + 40^\circ + 41^\circ + 39^\circ) + 5 \times 180^\circ + 5 \times 180^\circ$$

$$- 2(A + B + C + D + E) = 5 \times 180^\circ$$

Also: $A + B + C + D + E = 3 \times 180^\circ$ (internal angles of pentagon)

$$\Rightarrow \text{Solve for } x: \quad x = 180^\circ - 157^\circ = \underline{\underline{23^\circ}}$$

2 methods are presented.

Free from www.analyze-math.com

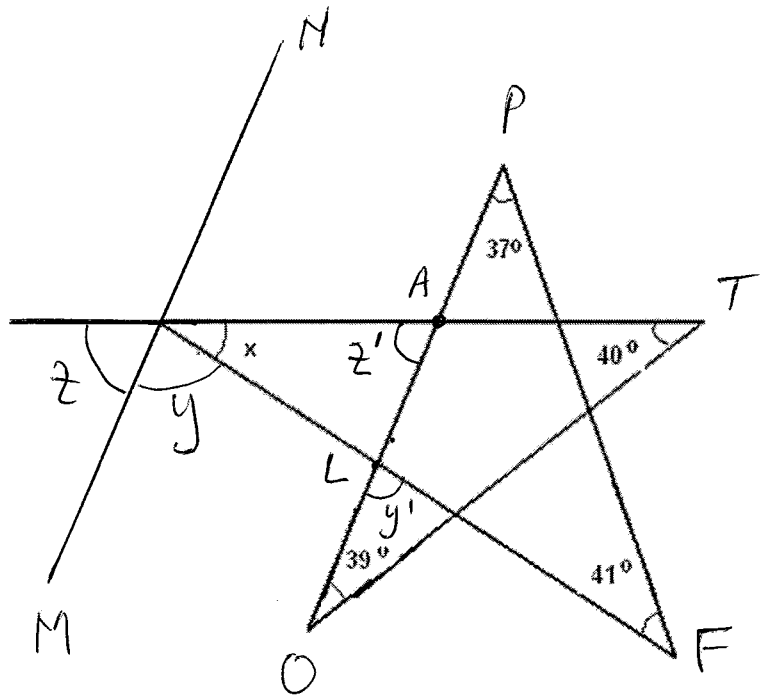
Geometry Worksheet: Angle (3)

Find the measure of angle x .

method (2)

We first draw a line MN parallel to OP .

label angles z and y that makes 180° with angle x .



label z' as the corresponding angle to z (since MN is parallel to OP) and $z = z'$

Use triangle ATO to write : $(180 - z') + 40^\circ + 39^\circ = 180^\circ$
Solve for $z' = 40^\circ + 39^\circ = 79^\circ$

label y' as the corresponding angle to y (parallel lines) and $y' = y$

Free from www.analyze-math.com

Use triangle PLF to write

$$(180 - y') + 37^\circ + 41^\circ = 180^\circ$$

$$\text{Solve for } y' = 37^\circ + 41^\circ = 78^\circ$$

$$\text{now } x + y + z = x + y' + z' = 180^\circ \Rightarrow x = 180^\circ - (79 + 78^\circ)$$

$$x = \underline{23^\circ}$$