Angles in Triangle

Example

Find the unknown in the following, giving brief reasons:

a

$x°$

$38°$ $19°$

b

$y°$ $39°$
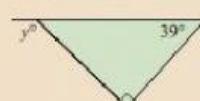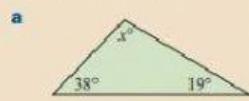
a $x + 38 + 19 = 180$ {angle sum of a triangle}

$\therefore \quad x = 180 - 38 - 19$

$\therefore \quad x = 123$

b $y = 39 + 90$ {exterior angle of a triangle}

$\therefore \quad y = 129$

Find the values of the unknowns in each triangle, giving a brief reason:

a

$2x°$

$(x+20)°$ $x°$

b

C D
$b°$ $120°$
B $a°$
A $140°$ $c°$
E

a $2x + x + (x + 20) = 180$ {angles of a triangle}
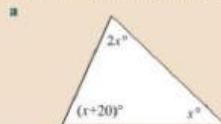
$\therefore \quad 4x + 20 = 180$

$\therefore \quad 4x = 160$

$\therefore \quad x = 40$

b $a + 140 = 180$ {angles on a line}

$\therefore \quad a = 180 - 140 = 40$

Likewise $b = 180 - 120 = 60$

But $a + b + c = 180$ {angles of a triangle}

$\therefore \quad 40 + 60 + c = 180$

$\therefore \quad 100 + c = 180$

$\therefore \quad c = 80$

Exercise:

1) Find the unknown in the following, give brief reasons:

a

$95°$

$23°$ $a°$

	Reason:

b

$b°$

$42°$ $47°$

	Reason:

c

$25°$

$46°$

$c°$

	Reason:

d

Triangle with angles $d°$, $47°$, and $81°$

		Reason:

e

Right triangle with angle $46°$ and $e°$

		Reason:

f

Triangle with angles $25°$, $f°$, and $33°$
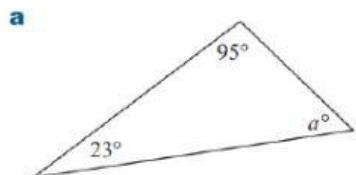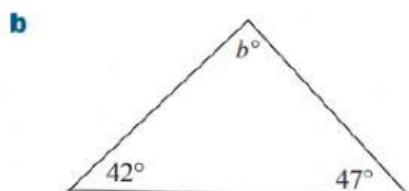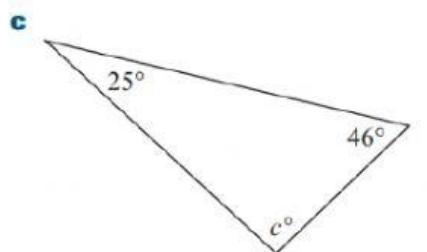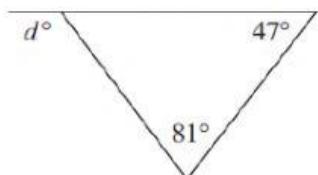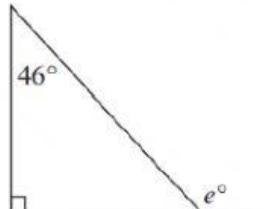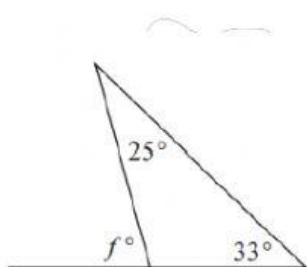
		Reason:

2) The three angles of a scalene triangle are $x°, (x - 12)°$ and $(2x + 6)°$. What are the sizes of this angles?