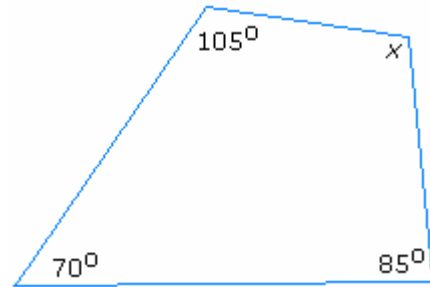


CHAPTER 7 Geometric Relationships  
7.2 Angle Relationships in Quadrilaterals  
Interior and Exterior Angle Relationships in a Quadrilateral

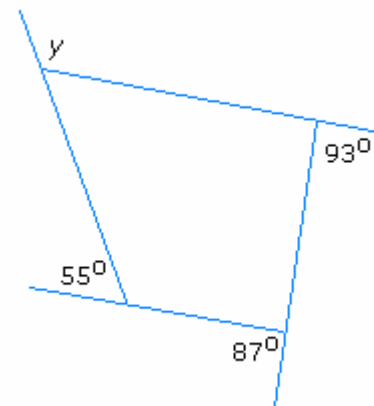
The sum of the interior angles in a quadrilateral is  $360^\circ$ .  
The sum of the exterior angles in a quadrilateral is  $360^\circ$ .

**Example:**

a) Find the measure of the unknown angle shown.



b) Find the measure of the unknown angle shown.



c) Find the unknown angles shown in the parallelogram.



**Solution:**

$$\begin{aligned} \text{a) } x + 85^\circ + 70^\circ + 105^\circ &= 360^\circ \\ x + 260^\circ &= 360^\circ \\ x + 260^\circ - 260^\circ &= 360^\circ - 260^\circ \\ x &= 100^\circ \end{aligned}$$

The unknown angle  $x = 100^\circ$ .

$$\begin{aligned} \text{b) } y + 93^\circ + 87^\circ + 55^\circ &= 360^\circ \\ y + 235^\circ &= 360^\circ \\ y + 235^\circ - 235^\circ &= 360^\circ - 235^\circ \\ y &= 125^\circ \end{aligned}$$

The unknown angle  $y = 125^\circ$ .

c) Adjacent angles are supplementary in a parallelogram.

$$\begin{aligned}x + 60^\circ &= 180^\circ \\x + 60^\circ - 60^\circ &= 180^\circ - 60^\circ \\x &= 120^\circ\end{aligned}$$

The unknown angle  $x = 120^\circ$ .

Angles at opposite vertices are equal.

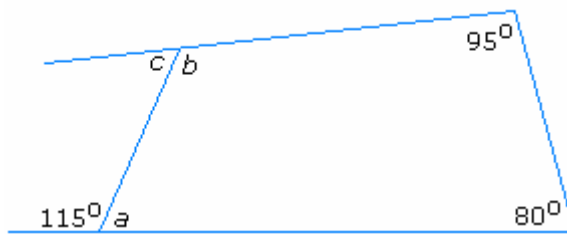
The unknown angle  $y = 60^\circ$ .

$$\begin{aligned}z &= x \\&= 120^\circ\end{aligned}$$

The unknown angle  $z = 120^\circ$ .

**Practice:**

1. a) Find the measure of the unknown angles shown.



b) Find the unknown angles shown.



**Answers:**

1. a)  $a = 65^\circ$ ,  $b = 120^\circ$ ,  $c = 60^\circ$

b)  $x = 60^\circ$ ,  $2x = 120^\circ$ ,  $w = 60^\circ$ ,  $y = 60^\circ$ ,  $z = 120^\circ$