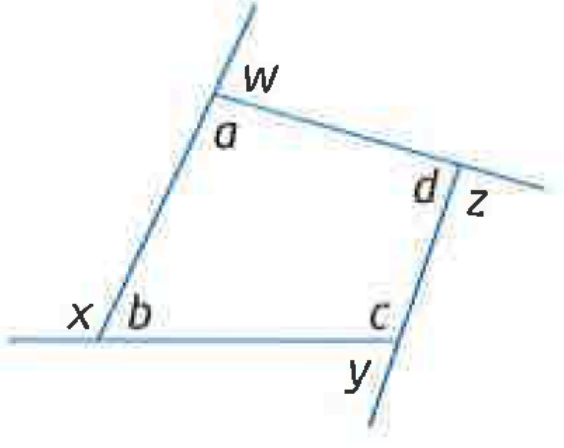
7.2 Angle Relationships in Quadrilaterals

Angle Relationships in Quadrilaterals

The sum of the **interior** angles of a quadrilateral is 360 degrees.

The sum of the **exterior** angles of a quadrilateral is also 360 degrees.



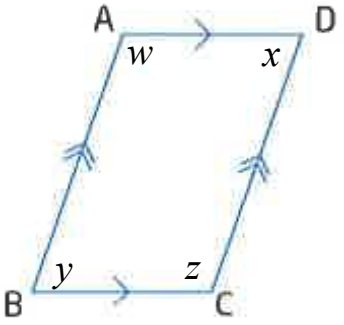
Interior angles:
$a + b + c + d = 360°$

Exterior angles:
$w + x + y + z = 360°$

Angle Relationships in Parallelograms

Adjacent angles in a parallelogram are supplementary (add to 180).

Opposite angles in a parallelogram are equal.



Adjacent angles:

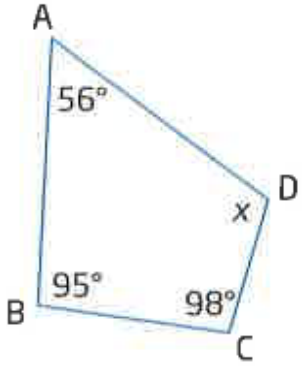
$w + x = 180$
$w + y = 180$
$y + z = 180$
$z + x = 180$

Opposite angles:

$w = z$
$x = y$

Example 1

Find the measure of the unknown angle



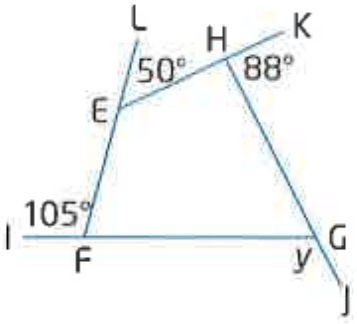
$x + 56 + 95 + 98 = 360$

$x = 360 - 56 - 95 - 98$

$x = 111°$

Example 2

Find the measure of the unknown angle



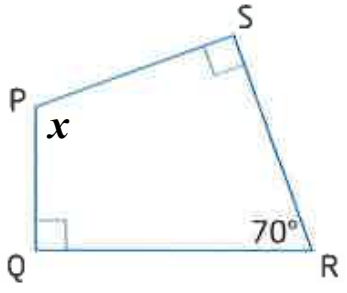
$y + 105 + 50 + 88 = 360$

$y = 360 - 105 - 50 - 88$

$y = 117^\circ$

Example 3

Find the measure of the unknown angle



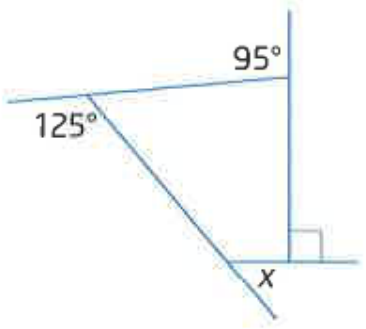
$x + 90 + 90 + 70 = 360$

$x = 360 - 90 - 90 - 70$

$x = 110^\circ$

Example 4

Find the measure of the unknown angle



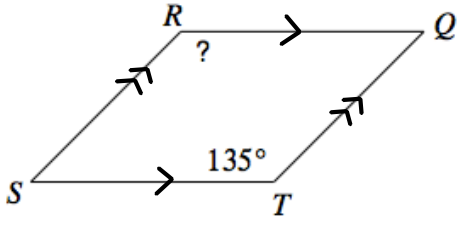
$x + 125 + 95 + 90 = 360$

$x = 360 - 125 - 95 - 90$

$x = 50^\circ$

Example 5

Find the measure of the unknown angle



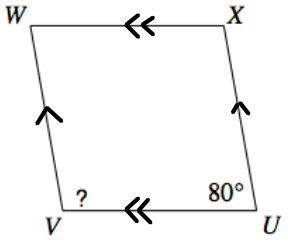
$\angle SRQ = \angle STQ$

$\angle SRQ = 135^\circ$

Opposite angles are equal in parallelograms

Example 6

Find the measure of the unknown angle



$\angle WVU + 80 = 180$

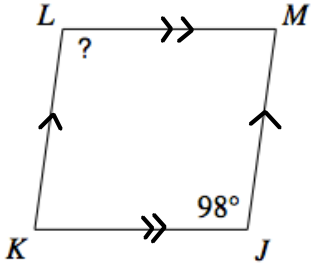
$\angle WVU = 180 - 80$

$\angle WVU = 100^\circ$

Adjacent angles are supplementary in a parallelogram

Example 7

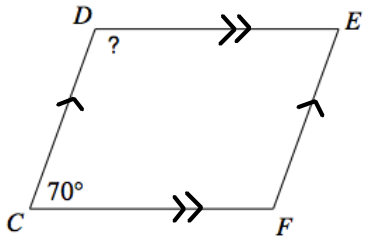
Find the measure of the unknown angle



$? = 98^\circ$ (opposite)

Example 8

Find the measure of the unknown angle



$? + 70 = 180$ (adjacent)

$? = 180 - 70$

$? = 110°$