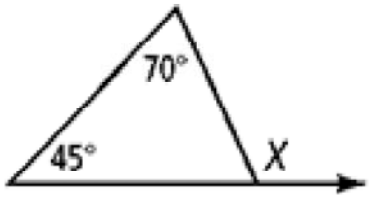
Triangle Angle-Sum Theorem:
The measures of the angles in a triangle add up to 180.

In the diagram at the right, ∠1 is an exterior angle of the triangle.
An **exterior angle** is an angle formed by one side of a polygon and an extension of an adjacent side.

Exterior Angle Theorem
The measure of an exterior angle is equal to the sum of its remote interior angles.
So, $m\angle 1 = m\angle 2 + m\angle 3$.

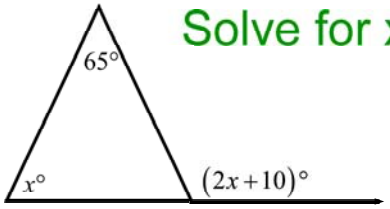
Example 1



X = 45 + 70
X = 115°

Example 2- EXTERIOR ANGLE THEOREM

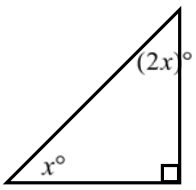
Solve for x.



2x + 10 = x + 65
−x −x
x + 10 = 65
−10 −10
x = 55°

Example 3- TRIANGLE SUM THEOREM

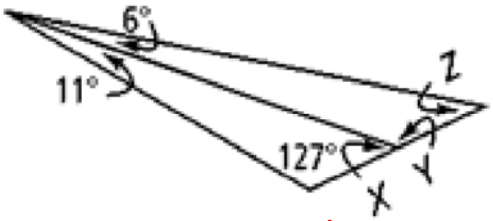
Solve for x.



x + 2x + 90 = 180
3x + 90 = 180
3x = 90
x = 30°

Example 4-

Find the value of each variable.



$x+11+127=180$

$x+138=180$

$x=42^{\circ}$

$x+y=180$

$42+y=180$

$y=138^{\circ}$

$6+y+z=180$

$6+138+z=180$

$144+z=180$

$z=36^{\circ}$