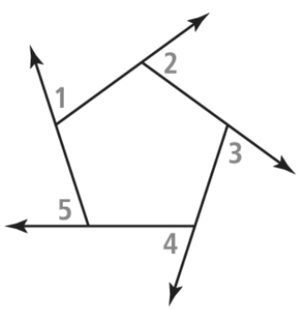
Sum of the exterior angles of convex polygon.

The sum of the measures of the exterior angles of a convex polygon, one at each vertex, is 360.

If...



Then... $m\angle 1 + m\angle 2 + m\angle 3 +$

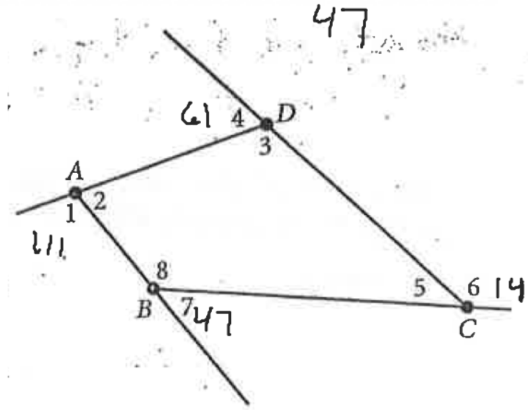
$m\angle 4 + m\angle 5 = 360$

111 61

In the figure, $m\angle 1 = 5x + 11, m\angle 4 = 3x + 1$

$m\angle 6 = 8x - 19$, and $m\angle 7 = 3x - 13$.

141 47



$m\angle 2 = 69$ $m\angle 3 = 119$

$m\angle 5 = 39$ $m\angle 8 = 133$

$m\angle 1 + m\angle 4 + m\angle 6 + m\angle 7 = 360$

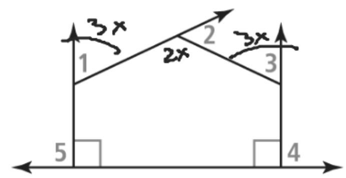
$5x+11 + 3x+1 + 8x-19 + 3x-13 = 360$

$19x - 20 = 360$

$19x = 380$

$x = 20$

Suppose $\angle 1 \cong \angle 3$, $m\angle 1 = 3x$, and $m\angle 2 = 2x$. What is the measure of each exterior angle?



SOLUTION

$m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 + m\angle 5 = 360$

$3x + 2x + 3x + 90 + 90 = 360$

$8x + 180 = 360$

$8x = 180$

$x = 22.5$

$m\angle 1 = 3(22.5)$
$= 67.5^\circ$

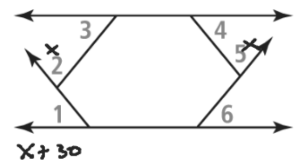
$m\angle 2 = 2(22.5)$
$= 45^\circ$

$m\angle 3 = 67.5^\circ$

$m\angle 4 = 90^\circ$

$m\angle 5 = 90^\circ$

4. Suppose $\angle 1 \cong \angle 3 \cong \angle 4 \cong \angle 6$, $\angle 2 \cong \angle 5$, and $m\angle 3 = m\angle 2 + 30$. What is $m\angle 4$?



Enter your answer

$$\underline{x+30}+\underline{x+30}+\underline{x+30}+\underline{x+30}+x+x=360$$

$$6x+120=360$$

$$6x=240$$

$$x=40$$

$$m\angle 4 = x+30$$
$$=40+30$$
$$=70^\circ$$

The measure of an exterior angle of a regular polygon is given. Find the number of sides of the polygon.

30 $= \frac{360}{30} = 12$-gon

20 $\frac{360}{20} = 18$-gon

5 $\frac{360}{5} = 72$-gon

The sum of the measure of the interior angles of a convex polygon is given. Find the number of sides in each polygon. $S = 180(n-2)$

S = 2160

$2160 = 180(n-2)$

$\underset{360}{2160} = 180n - 360$

$2520 = 180n$

$n = 14$-gon

$\frac{2160}{180} = \frac{180(n-2)}{180}$

$12 = n-2$

S = 6120

$6120 = 180(n-2)$

$\underset{360}{6120} = 180n - 360$

$6480 = 180n$

$n = 36$

S = 4140

$\frac{4140}{180} = \frac{180(n-2)}{180}$

$23 = n-2$

$n = 25$