

Bellwork

01/23/2012

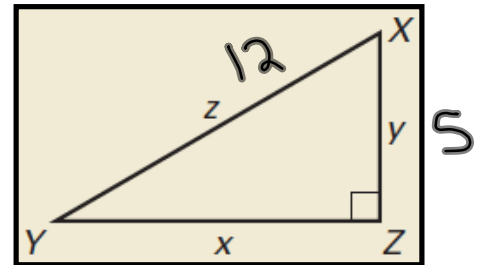
Find the value of the variable.

1. If $x=9$ and $z=11$, find $m\angle X$ to the nearest tenth of a degree.

$$\sin X = \frac{9}{11}$$

$$m\angle X = \sin^{-1}\left(\frac{9}{11}\right)$$

$$m\angle X = 54.9^\circ$$



2. If $y=5$ and $z=12$, find $m\angle X$ to the nearest tenth of a degree.

$$\cos X = \frac{5}{12}$$

$$m\angle X = \cos^{-1}\left(\frac{5}{12}\right)$$

$$m\angle X = 65.4^\circ$$

Geometry
8.1 Find Angle Measures in Polygons
Standard(s): 2, 4

Vocabulary:

Consecutive Vertices: Two vertices that are endpoints of the same side.

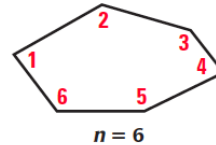
Diagonal: A segment that joins two nonconsecutive vertices.

THEOREMS*For Your Notebook***THEOREM 8.1 Polygon Interior Angles Theorem**

The sum of the measures of the interior angles of a convex n -gon is $(n - 2) \cdot 180^\circ$.

$$m\angle 1 + m\angle 2 + \cdots + m\angle n = (n - 2) \cdot 180^\circ$$

Proof: Ex. 33, p. 512 (for pentagons)

**COROLLARY TO THEOREM 8.1 Interior Angles of a Quadrilateral**

The sum of the measures of the interior angles of a quadrilateral is 360° .

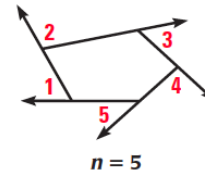
Proof: Ex. 34, p. 512

THEOREM*For Your Notebook***THEOREM 8.2 Polygon Exterior Angles Theorem**

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

$$m\angle 1 + m\angle 2 + \cdots + m\angle n = 360^\circ$$

Proof: Ex. 35, p. 512



Sum of Interior \angle 's: $180(n-2)$

Interior \angle of Regular: $\frac{180(n-2)}{n}$

Sum of Interior \angle 's of Quad: 360°

Sum of Exterior \angle 's: 360°

Exterior \angle of Regular: $\frac{360}{n}$

Find the Sum of Angles in Polygons

Find the sum of the measures of the interior angles of the convex polygon.

$$180(n-2)$$

11-gon

$$n = 11$$

$$180(11-2)$$

$$180(9)$$

$$1620^\circ$$

15-gon

$$180(n-2)$$

$$180(15-2)$$

$$180(13)$$

$$2340^\circ$$

Find the # of Sides

The sum of the measures of the interior angles of a convex polygon is given. Classify the polygon by the number of sides.

1800°

$$\frac{180(n-2)}{180} = \frac{1800}{180}$$

$$n-2 = 10$$

$$+2 \quad +2$$

2520° $n = 12$

3960°

$$\frac{180(n-2)}{180} = \frac{3960}{180}$$

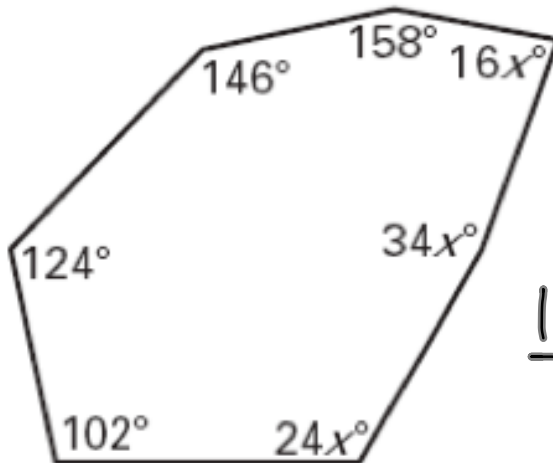
$$n-2 = 22$$

$$+2 \quad +2$$

$$n = 24$$

Find a Missing Value

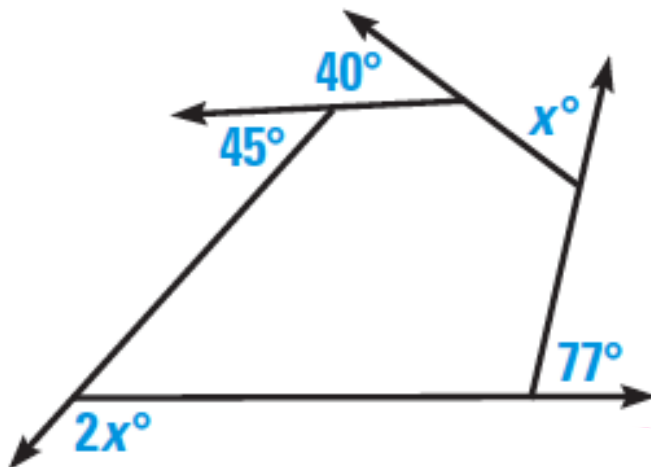
Find the value of x .



$$\begin{aligned}
 n &= 7 & 180(n-2) \\
 & & 180(7-2) \\
 & & 180(5) \\
 & & 900
 \end{aligned}$$

$$\underline{16x} + \underline{34x} + \underline{24x} + \underbrace{102}_{158} + \underbrace{124}_{146} +$$

$$\begin{aligned}
 & 900 \\
 74x + 530 &= 900 \\
 74x &= 370 \\
 x &= 5
 \end{aligned}$$



$$x + 2x + 77 + 45 + 40 = 360$$

$$3x + 162 = 360$$

$$3x = 198$$

$$x = 66$$

Regular Polygons

Find the measure of an interior and exterior angle of the indicated regular polygon.

Regular Pentagon

$$n = 5$$

$$I: \frac{180(n-2)}{n}$$

$$E: \frac{360}{5}$$

$$I: \frac{180(3)}{5}$$

$$E = 72^\circ$$

$$I = 108^\circ$$

Regular 90-gon

$$\frac{180(90-2)}{90}$$

$$\frac{180(88)}{90} = 176^\circ$$

$$\frac{360}{90}$$

$$4$$

Homework Assignment

Worksheet 8.1B

