

Adv. Geometry 8.1 Polygons & key

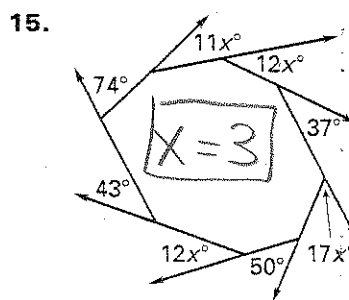
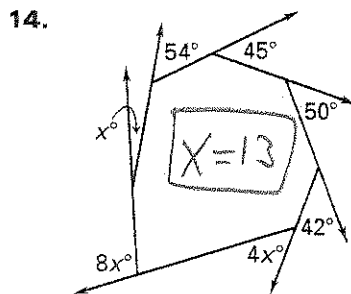
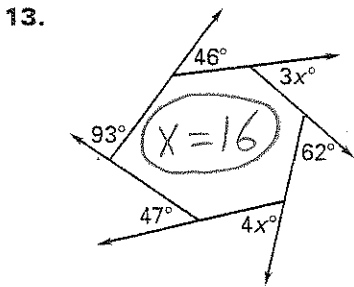
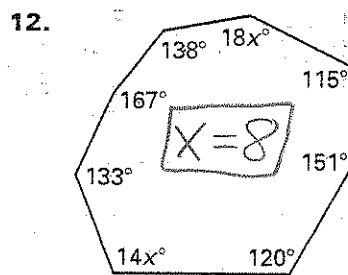
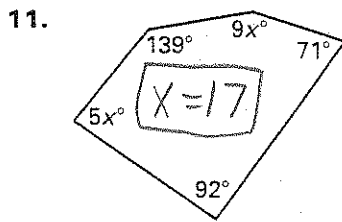
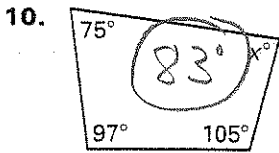
Find the sum of the measures of the interior angles of the indicated convex polygon.

1. 21-gon $(21-2)180 = 3420^\circ$
 2. 35-gon 5940°
 3. 50-gon 8640°

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

4. 1440° $180n - 360 = 1440$
 $n = 10$ decagon
 5. 3060° 19-gon
 6. 3780° 23-gon
 7. 6480° 38-gon
 8. 8100° 47-gon
 9. 8820° 51-gon

Find the value of x .



16. What is the measure of each interior angle of a regular nonagon? $\frac{(9-2)180}{9} = 140^\circ$
 17. The measures of the exterior angles of a convex hexagon are 45° , 60° , x° , $3x^\circ$, $7x^\circ$, and 90° . What is the measure of the largest exterior angle? 105°
 18. The measures of the interior angles of a convex decagon are 150° , 145° , 130° , $34x^\circ$, $35x^\circ$, 135° , 160° , 120° , $30x^\circ$, and $21x^\circ$. What is the measure of the smallest interior angle? 105° $x=5^\circ$

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

19. Regular heptagon 20. Regular dodecagon 21. Regular 17-gon
 22. Regular 50-gon 23. Regular 70-gon 24. Regular 125-gon

- (19) Int. $\approx 128.6^\circ$ (20) Int. = 150° (21) Int. $\approx 158.8^\circ$ (22) Int. $\approx 172.8^\circ$
 Ext. $\approx 51.4^\circ$ Ext. = 30° Ext. $\approx 21.2^\circ$ Ext. $\approx 7.2^\circ$
 (23) Int. $\approx 174.9^\circ$ (24) Int. 177.1°
 Ext. $\approx 5.1^\circ$ Ext. $\approx 2.9^\circ$

In Exercises 25–28, find the value of n for each regular n -gon described.

25. Each interior angle of the regular n -gon has a measure of 165° . 24
26. Each interior angle of the regular n -gon has a measure of 177.6° . 150
27. Each exterior angle of the regular n -gon has a measure of 5° . 72
28. Each exterior angle of the regular n -gon has a measure of 12° . 30

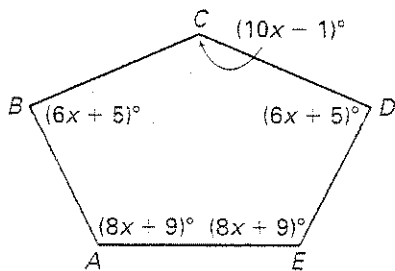
Determine if it is possible for a regular polygon to have an interior angle with the given angle measure. Explain your reasoning.

29. 155° 30. 160° 31. 175° 32. 168°
No, 14.4 sides? *Yes, 18 sides* *Yes, 72 sides* *Yes, 30 sides*

Tell whether each statement is *always*, *sometimes*, or *never* true.

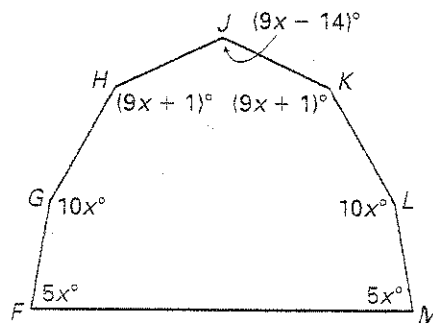
33. As the number of sides of a polygon increases, the sum of the interior angles increases. *Always*
34. As the number of sides of a polygon increases, the sum of the exterior angles decreases. *Never*
35. If the number of sides of an equiangular polygon is doubled, the measure of each exterior angle is halved. *Always*
36. The measure of an exterior angle of a decagon is greater than the measure of an exterior angle of a pentagon. *Sometimes*

37. **Light Fixture** The side view of a light fixture is shown below. Find the value of x . Then determine the measure of each angle.



$x = 13.5$
 $\angle A = 117^\circ$
 $\angle B = 86^\circ$
 $\angle C = 134^\circ$
 $\angle D = 86^\circ$
 $\angle E = 117^\circ$

38. **Tent** The front view of a camping tent is shown below. Find the value of x . Then determine the measure of each angle.



$x = 16$
 $\angle F = 80^\circ$
 $\angle G = 160^\circ$
 $\angle H = 145^\circ$
 $\angle J = 130^\circ$
 $\angle K = 145^\circ$
 $\angle L = 160^\circ$
 $\angle M = 80^\circ$