

LESSON 8.1

Practice

For use with pages 506-513

$sum\ of\ int.\ \angle = (n-2)180$

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

1. Hexagon

$n=6$
 $(6-2)180$
 $= 720^\circ$

2. Dodecagon

$n=12$
 $(12-2)180$
 $= 1800^\circ$

3. 11-gon

4. 15-gon

$n=15$
 $(15-2)180$
 $= 2340^\circ$

5. 20-gon

6. 40-gon

$n=40$
 $(40-2)180$
 $= 6840^\circ$

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

7. $180^\circ = \frac{(n-2)180}{180}$
 $1 = n-2$
 $+2$
 $n=3$
Triangle

8. $540^\circ = \frac{(n-2)180}{180}$
 $3 = n-2$
 $+2$
 $n=5$
Pentagon

9. $900^\circ = \frac{(n-2)180}{180}$
 $5 = n-2$
 $+2$
 $n=7$
Septagon
 Heptagon

10. 1800°

11. $2520^\circ = (n-2)180$
 $14 = n-2$
 $n=16$
16-gon

12. 3960°

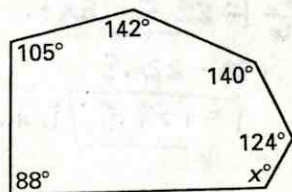
13. $5040^\circ = (n-2)180$
 $28 = n-2$
 $n=30$
30-gon

14. 5940°

15. $8640^\circ = (n-2)180$
 $48 = n-2$
 $n=50$
50-gon

Find the value of x.

16.

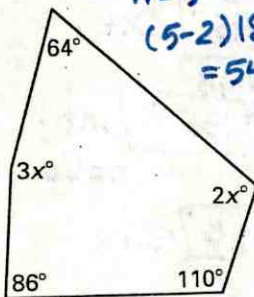


$n=6$
 $(6-2)180$
 $= 720^\circ$

$720 = 105 + 142 + 140 + 124 + 88 + x$
 $720 = 599 + x$

$x = 121^\circ$

17.



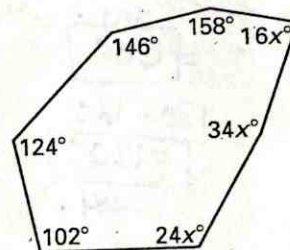
$n=5$
 $(5-2)180$
 $= 540^\circ$

$540 = 64 + 86 + 110 + 2x + 3x$

$540 = 260 + 5x$

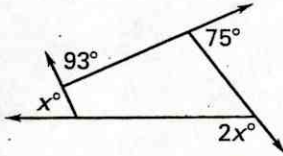
$280 = 5x$
 $x = 56$

18.



LESSON 8.1 Practice *continued*
For use with pages 506-513

19.



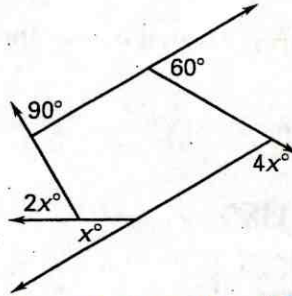
$$360 = x + 2x + 75 + 93$$

$$360 = 3x + 168$$

$$192 = 3x$$

$$\boxed{x = 64}$$

20.



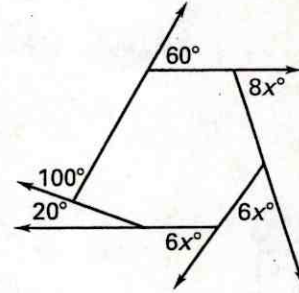
$$360 = x + 2x + 4x + 90 + 60$$

$$360 = 7x + 150$$

$$210 = 7x$$

$$\boxed{x = 30}$$

21.



22. What is the measure of each exterior angle of a regular nonagon? $n = 9$

$$\text{each ext. } \angle = \frac{360}{n}$$

$$\frac{360}{9} = \boxed{40^\circ} \quad \begin{matrix} 140 \\ \text{Ext.} & \text{Int.} \end{matrix}$$

23. The measures of the exterior angles of a convex quadrilateral are 90° , $10x^\circ$, $5x^\circ$, and 45° . What is the measure of the largest exterior angle?

$$90 + 10x + 5x + 45 = 360$$

$$135 + 15x = 360$$

$$15x = 225$$

$$x = 15$$

$$10(15) \quad 5(15)$$

$$\boxed{150^\circ}$$

24. The measures of the interior angles of a convex octagon are $45x^\circ$, $40x^\circ$, 155° , 120° , 155° , $38x^\circ$, 158° , and $41x^\circ$. What is the measure of the smallest interior angle?

$$\text{one int. } \angle = \frac{(n-2)180}{n}$$

$$\text{one ext. } \angle = \frac{360}{n}$$

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

25. Regular triangle $n = 3$

$$\frac{(3-2)180}{3} = \boxed{60^\circ} \text{ Int.}$$

$$180 - 60 = \boxed{120^\circ} \text{ Ext.}$$

28. Regular 45-gon

26. Regular octagon $n = 8$

$$\frac{360}{8} = \boxed{45^\circ} \text{ Ext.}$$

$$180 - 45 = \boxed{135^\circ} \text{ Int.}$$

29. Regular 60-gon $n = 60$

$$\frac{360}{60} = \boxed{6^\circ} \text{ Ext.}$$

$$180 - 6 = \boxed{174^\circ} \text{ Int.}$$

27. Regular 16-gon $n = 16$

$$\frac{360}{16} = \boxed{22.5^\circ} \text{ Ext.}$$

$$180 - 22.5 = \boxed{157.5^\circ} \text{ Int.}$$

30. Regular 100-gon

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8.1

Practice *continued*
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one int. $\angle = \frac{(n-2)180}{n}$

one ext. $\angle = \frac{360}{n}$

In Exercises 31-34, find the value of n for each regular n -gon described.

OR you could just do \leftarrow

31. Each interior angle of the regular n -gon has a measure of 140° .

$140 = \frac{(n-2)180}{n}$

$140n = (n-2)180$
 $140n = 180n - 360$
 $-180n \quad -180n$

$-40n = -360$
 $-40 \quad -40$
 $n = 9$

int $\angle = 140$
Ext $\angle = 40$
 $40 = \frac{360}{n}$

32. Each interior angle of the regular n -gon has a measure of 175.2° .

Ext $\angle = 180 - 175.2$

$4.8 = \frac{360}{n}$

$4.8n = 360$
 $n = 75$

75-gon

$40n = 360$
 $n = 9$

33. Each exterior angle of the regular n -gon has a measure of 45° .

$45 = \frac{360}{n}$

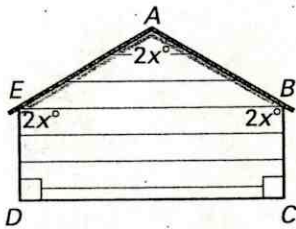
$45n = 360$
 $n = 8$ octagon

34. Each exterior angle of the regular n -gon has a measure of 3° .

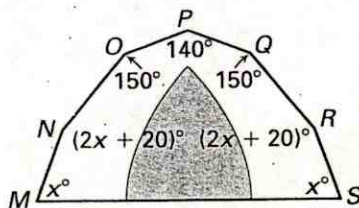
$3 = \frac{360}{n}$

$3n = 360$
 $n = 120$ 120-gon

35. **Storage Shed** The side view of a storage shed is shown below. Find the value of x . Then determine the measure of each angle.



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



37. **Proof** Because all the interior angle measures of a regular n -gon are congruent, you can find the measure of each individual interior angle. The measure of each interior angle of a regular n -gon is $\frac{(n-2) \cdot 180}{n}$. Write a paragraph proof to prove this statement.