#15 Page 161 1-36, 40-44, 47-49

EXERCISES

For more exercises, see *Extra Skill, Word Problem, and Proof Practice.*

Standards Practice

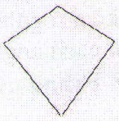
GEOM 12.0, 13.0

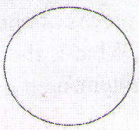
A Practice by Example

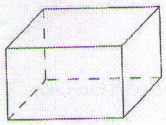
Is the figure a polygon? If not, tell why.

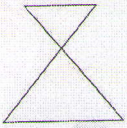
Example 1 (page 157)

GO for Help

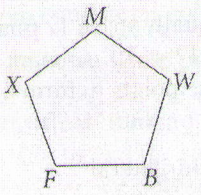
1. 

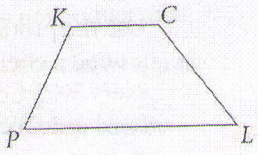
2. 

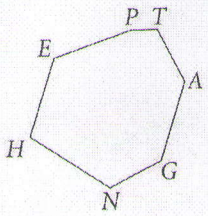
3. 

4. 

Name each polygon by its vertices. Then identify its sides and angles.

5. 

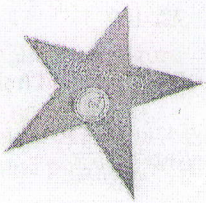
6. 

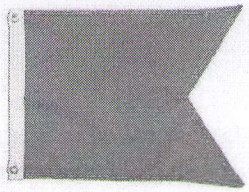
7. 

Example 2 (page 158)

Find a polygon in each photograph. Classify the polygon by its number of sides. Tell whether the polygon is convex or concave.

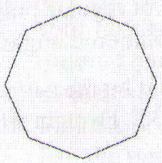
8. 

9. 

10. 

Example 3 (page 159)

Find the sum of the measures of the angles of each polygon.

11. 

12. dodecagon

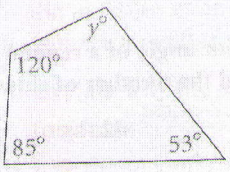
13. decagon

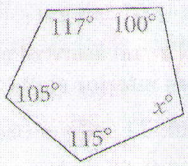
14. 20-gon

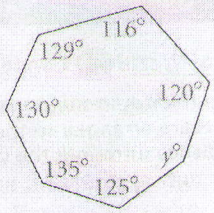
15. 1002-gon

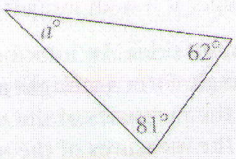
Example 4 (page 160)

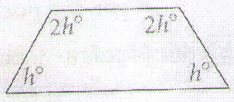
Algebra Find the missing angle measures.

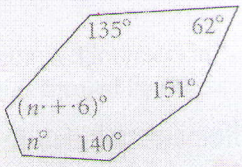
16. 

17. 

18. 

19. 

20. 

21. 

Example 5 (page 160)

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

22. pentagon

23. dodecagon

24. 18-gon

25. 100-gon

Packaging **The nut container at the right has the shape of a regular octagon. It fits in a square box. A cheese wedge fills each corner of the box.**

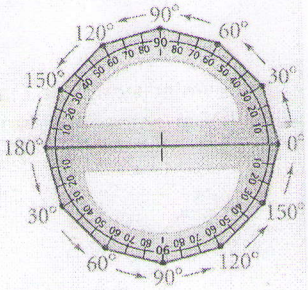
26. Find the measure of each angle of a cheese wedge.

27. Critical Thinking Show how to rearrange the four pieces of cheese to make a regular polygon. What is the measure of each angle of the polygon?

Use a protractor. Sketch each type of regular polygon.

Sample: dodecagon

Use the protractor to equally space 12 points around a circle. ($360° \div 12 = 30°$, so mark a point every 30°.) Connect these points to form a regular dodecagon.



28. triangle **29.** quadrilateral

30. hexagon **31.** octagon

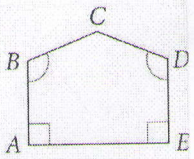
The sum of the measures of the angles of a polygon with n sides is given. Find n.

32. 180 **33.** 1080 **34.** 1980 **35.** 2880

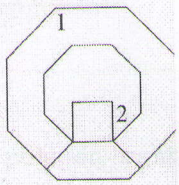
36. Multiple Choice In the figure at right, $\angle B \cong \angle D$ and $m\angle C = 130$. What is $m\angle B$?

(A) 25 (C) 115

(B) 50 (D) 160



37. Stage Design The diagram at the right shows platforms constructed for a theater-in-the-round stage. Describe the largest platform by the type of regular polygon it suggests. Find the measure of each numbered angle.



38. Error Analysis Miles said that he measured an angle of a regular polygon to be 130°. Explain why this result is impossible.

39. Critical Thinking A triangle has two congruent angles and an exterior angle with measure 100. Find two possible sets of measures for the angles of the triangle.

The measure of an exterior angle of a regular polygon is given. Find the measure o an interior angle, and find the number of sides.

40. 72 **41.** 36 **42.** 18 **43.** 30 **44.** x

45. Probability Find the probability that the measure of an angle of a regular n-gon is a positive integer if n is an integer and $3 \leq n \leq 12$.

46. Algebra A polygon has n sides. An interior angle of the polygon and an adjacent exterior angle form a straight angle.

a. What is the sum of the measures of the n straight angles?

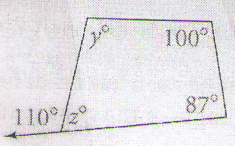
b. What is the sum of the measures of the n interior angles?

c. Using your answers above, what is the sum of the measures of the n exterior angles?

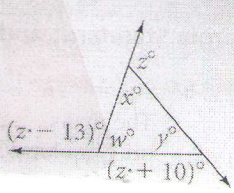
d. What theorem do the steps above lead to?

Algebra **Find each missing angle measure. Then name the polygon.**

47.



48.



49.