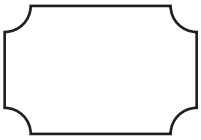
Name _____ Date _____

LESSON 1.6

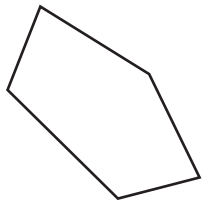
LESSON 1.6 Practice B

For use with pages 42–47

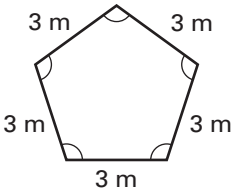
Tell whether the figure is a polygon. If it is not, explain why. If it is a polygon, tell whether it is *convex* or *concave*.

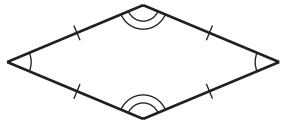
1. 

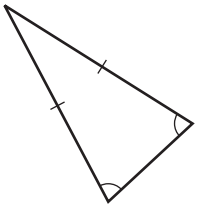
2. 

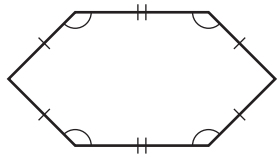
3. 

Classify the polygon by the number of sides. Tell which terms apply to the polygon: *equilateral*, *equiangular*, *regular*, or *not regular*. *Explain* your reasoning.

4. 

5. 

6. 

7. 

8. The lengths (in feet) of two sides of a regular quadrilateral are represented by the expressions $8x - 6$ and $4x + 22$. Find the length of a side of the quadrilateral.

9. The expressions $(3x + 63)°$ and $(7x - 45)°$ represent the measures of two angles of a regular decagon. Find the measure of an angle of the decagon.

10. The expressions $-2x + 41$ and $7x - 40$ represent the lengths (in kilometers) of two sides of an equilateral pentagon. Find the length of a side of the pentagon.

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

11. A quadrilateral is convex.

12. An octagon is regular.

13. A triangle is concave.

14. A regular polygon is equilateral.

Draw a figure that fits the description.

15. A quadrilateral that is not regular

16. A convex heptagon

17. A concave pentagon

18. An equiangular hexagon that is not equilateral

Name _____ Date _____

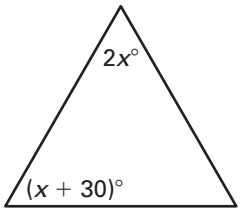
LESSON 1.6

Practice B *continued*

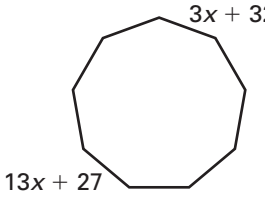
For use with pages 42–47

Each figure is a regular polygon. Find the value of *x*.

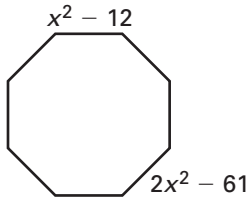
19.



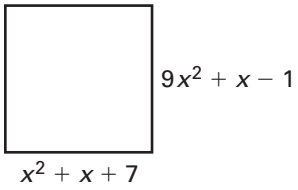
20.



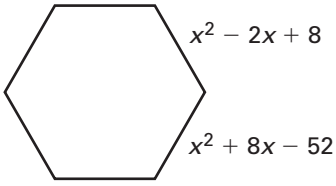
21.



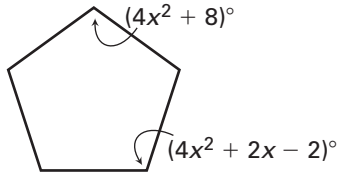
22.



23.

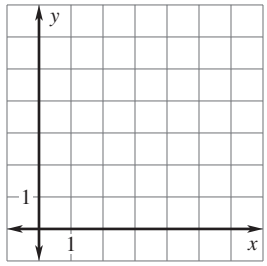


24.

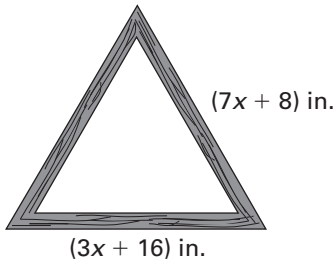


25. The vertices of a figure are given below. Plot and connect the points so that they form a convex polygon. Classify the figure. Then show that the figure is equilateral using algebra.

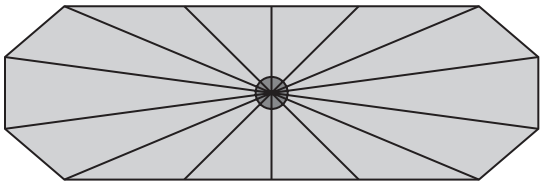
$A(3, 0)$, $B(3, 6)$, $C(2, 3)$, $D(4, 3)$



26. Picture frames A picture frame with a wooden border is a regular triangle, as shown. You want to decorate the frame by wrapping a ribbon around it. How many feet of ribbon are needed to wrap the ribbon around the border one time? Check that your answer is reasonable.



27. Parachutes The canopy of a parachute is shown in the diagram.



a. Is the shape of the canopy a *convex* or *concave* polygon?

b. Classify the polygon by the number of sides. Then use a ruler and a protractor to determine whether the figure is equilateral, equiangular, regular, or not regular.

c. Determine the number of lines of symmetry in the canopy. How does this differ from a regular octagon?

Practice Level B

1. The figure is not a polygon because part of the figure is not a segment. **2.** The figure is a concave polygon. **3.** The figure is a convex polygon. **4.** pentagon; regular, equilateral, equiangular; It has 5 sides, and it has congruent sides and congruent angles.

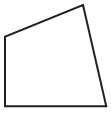
5. quadrilateral; equilateral, not regular; It has 4 sides. It is equilateral, but not equiangular. **6.** triangle; not regular; It has 3 sides. It is neither equilateral nor equiangular.

7. hexagon; not regular; It has 6 sides. It is neither equilateral nor equiangular. **8.** 50 ft

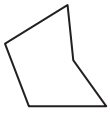
9. 144° **10.** 23 km **11.** sometimes

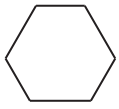
12. sometimes **13.** never **14.** always

15. *Sample answer:* **16.** *Sample answer:*

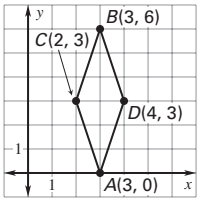


17. *Sample answer:* **18.** *Sample answer:*





19. 30 **20.** $\frac{1}{2}$ **21.** ± 7 **22.** ± 1 **23.** 6 **24.** 5

25. 

quadrilateral;

$AC = \sqrt{(3-2)^2 + (0-3)^2} = \sqrt{10}$,

$AD = \sqrt{(3-4)^2 + (0-3)^2} = \sqrt{10}$,

$BC = \sqrt{(3-2)^2 + (6-3)^2} = \sqrt{10}$,

$BD = \sqrt{(3-4)^2 + (6-3)^2} = \sqrt{10}$;

$AC = AD = BC = BD$

26. 5.5 ft; The sides of the triangle are congruent because the triangle is regular. Using this fact, write and solve an equation to find x. Then determine the perimeter of the triangle in feet.

27. a. convex **b.** octagon; equiangular, not regular **c.** 2; This octagon has only 2 lines of symmetry while a regular octagon has 8.

Practice Level C

1. Yes; concave **2.** No; some segments intersect more than two segments. **3.** Yes; convex

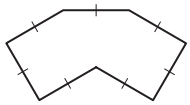
4. Quadrilateral; regular, equilateral, equiangular; the figure has congruent sides and congruent angles. **5.** Dodecagon; equilateral, not regular; the figure is not convex.

6. Octagon; equiangular, not regular; the sides are not congruent. **7.** Heptagon; regular, equilateral, equiangular; the figure has congruent sides and congruent angles.

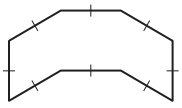
8. 23 m **9.** 41.5 in. **10.** 114.5 ft

11. *Sample answer:*

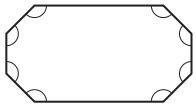
12. *Sample answer:*



13. *Sample answer:*



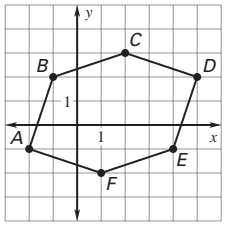
14. *Sample answer:*



15. never **16.** always **17.** sometimes

18. never **19.** 9 **20.** 7 **21.** 8 **22.** 4, –4

23. 6, –6 **24.** 4.5

25. 

Hexagon;

$AB = \sqrt{(-1-(-2))^2 + (2-(-1))^2} = \sqrt{10}$,

$BC = \sqrt{(2-(-1))^2 + (3-2)^2} = \sqrt{10}$,

$CD = \sqrt{(5-2)^2 + (2-3)^2} = \sqrt{10}$,

$DE = \sqrt{(4-5)^2 + (-1-2)^2} = \sqrt{10}$,

$EF = \sqrt{(1-4)^2 + (-2-(-1))^2} = \sqrt{10}$,

$FA = \sqrt{(-2-1)^2 + (-1-(-2))^2} = \sqrt{10}$;

$AB = BC = CD = DE = EF = FA$

26. a. 1: 18-gon, 2: decagon, 3: heptagon, 4: quadrilateral **b.** 1: concave, 2: convex, 3: convex, 4: convex **c.** The notches allow the paper to be folded into right or straight angles with a minimal amount of overlap.