Answers for 1.6

For use with pages 44–47

1.6 Skill Practice

1. An n-gon is a polygon with n sides.

2. Yes, the string will match the sides of a convex polygon, so it will be the perimeter of the polygon; no, the length of the string will be less than the perimeter of the polygon.

3. polygon; concave

4. Not a polygon; part of the figure is not a segment.

5. polygon; convex

6. Not a polygon; some segments intersect more than two segments.

7. C

8. Octagon; regular; it has 8 congruent sides and angles.

9. Pentagon; regular; it has 5 congruent sides and angles.

10. Triangle; regular; it has 3 congruent sides and angles.

11. Triangle; none of these; the sides and/or the angles are not all congruent.

12. Quadrilateral; equilateral; it has 4 congruent sides.

13. Quadrilateral; equiangular; it has 4 congruent angles.

14. Student A: the hexagon is concave, Student B: the hexagon does not have congruent sides.

15. 8 in. **16.** 140°

17. 3 ft **18.** always

19. sometimes **20.** always

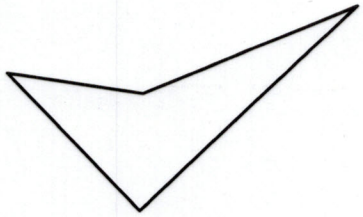
21. never **22.** always

23. never

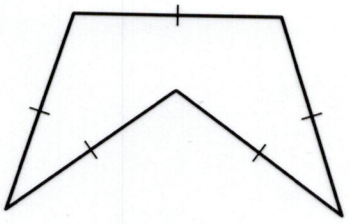
24–27. Sample answer are given.

24.

25.



26.



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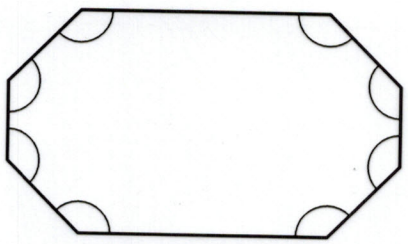


28. 4 **29.** 1 **30.** 50

31. 72°, 72°, 36°. *Sample answer:* To find the measure of the angles of the pentagon, solve $20x + 48 = 33x + 9$ to get $x = 3$. This will get the measures of the angles of the pentagon equal to 180°. $\angle ABC$ and $\angle ACB$ form a linear pair with an angle of a pentagon so they are both equal to $180 - 108 = 72°$. $\angle BAC$, $\angle CAD$, and $\angle DAE$ must have a sum of 180°. Since $\angle CAB \cong \angle DAE$, $2x + 108 = 180$, $x = 36$.

1.6 Problem Solving

32. a. convex

b. Octagon, it appears to be regular.

33. triangle; regular

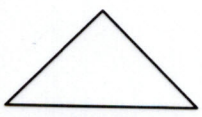
34. quadrilateral; equiangular

35. octagon: regular

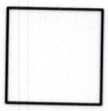
36. dodecagon; none of these

37. C

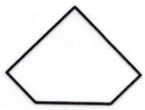
38. a–b. *Sample:*



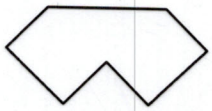
triangle
convex
none



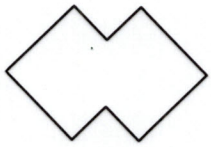
quadrilateral
convex
regular



pentagon
convex
none

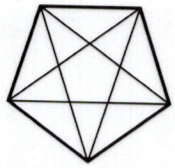


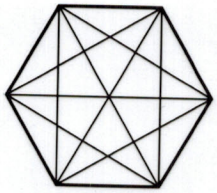
heptagon
concave
none

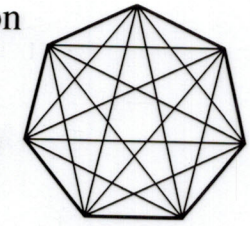


octagon
concave
equiangular

39. 105 mm; each side of the button is 15 millimeters long, so the perimeter of the button is $15(7) = 105$ millimeters.

40. a. Pentagon  5, 5

Hexagon  6, 9

Heptagon  7, 14

The difference between the successive number of diagonals is increasing by one.

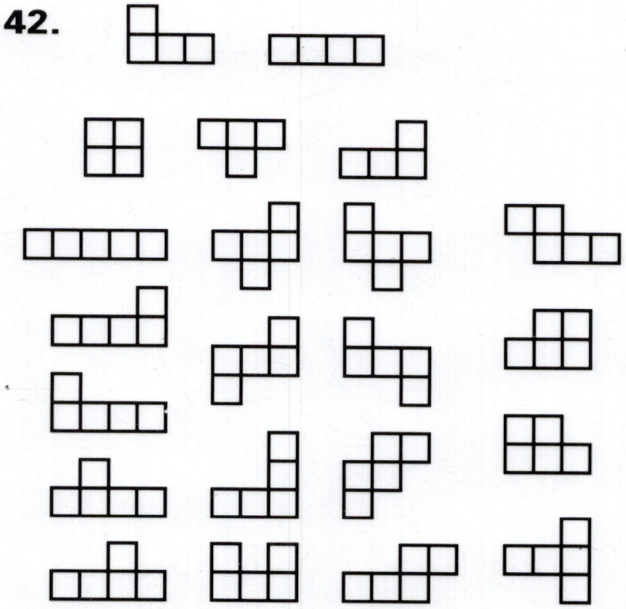
b. 20 diagonals; 27 diagonals. *Sample answer:* The pattern described continues.

c. 1710 diagonals

41. a. 3 **b.** 5

c. 6 **d.** 8

42.



1.6 Mixed Review

43. 8 **44.** ± 12

45. ± 10 **46.** 50,000

47. 63,360 **48.** $18\frac{2}{3}$

49. 1,200,000 **50.** $1\frac{1}{2}$

51. 3.8 **52.** about 28.2

53. 15 **54.** about