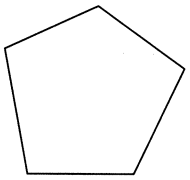
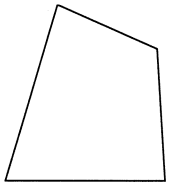
Name _____ Date _____

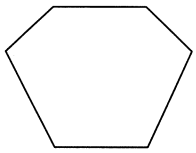
Practice 22

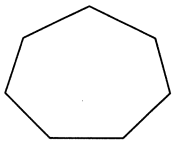
For use with Section 3-4

Find the sum of the measures of the angles and the sum of the measures of the exterior angles, one angle at each vertex, of each polygon.

1. 

2. 

3. 

4. 

Find the measure of each angle and each exterior angle of a regular polygon with the given number of sides.

5. 3 **6.** 8 **7.** 10

8. 9 **9.** 12 **10.** 15

11. Kin Yui measures four of the angles of a pentagon and finds that their measures are 85°, 110°, 125°, and 105°. What is the measure of the fifth angle of Kin Yui's pentagon?

12. A hexagon has a line of symmetry that passes through the midpoints of two sides. Two of the three angles on one side of the line of symmetry have measures 102° and 128°, respectively. What is the measure of the third angle on the same side of the line of symmetry?

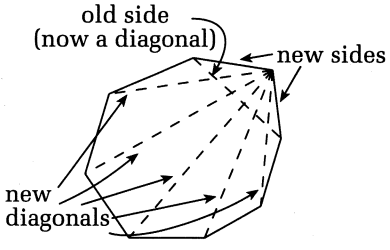
13. In this exercise, you will use mathematical induction to prove that a polygon with n sides has $\frac{n^2 - 3n}{2}$ diagonals.

Number of sides n	Number of diagonals	$\frac{n^2 - 3n}{2}$
4		
5		
6		

a. Complete the table at the right by sketching each polygon and counting its diagonals.

b. Is the statement true for $n = 4$, 5, and 6?

c. Suppose $F(k) = \frac{k^2 - 3k}{2}$ is a formula for the number of diagonals of a polygon with k sides. Suppose one side is replaced by two (adjacent) sides, so that the polygon now has $k + 1$ sides. How many new diagonals will be created? (Don't forget the one that used to be a side!)



d. Use the result of part (c) to show that $F(k + 1) = \frac{(k + 1)^2 - 3(k + 1)}{2}$.