

## Lesson 8-3

## Example 1

Find the number of diagonals for the following figures.

- a. a hexagon                      b. a quadrilateral                      c. a nonagon

## Solution

- a. A hexagon has six sides. So applying the formula gives

$$\frac{6(6 - 3)}{2} = \frac{6(3)}{2} = 9 \text{ diagonals.}$$

- b. A quadrilateral has four sides. So applying the formula gives

$$\frac{4(4 - 3)}{2} = \frac{4(1)}{2} = 2 \text{ diagonals.}$$

- c. A nonagon has nine sides. So applying the formula gives

$$\frac{9(9 - 3)}{2} = \frac{9(6)}{2} = 27 \text{ diagonals.}$$

## Example 2

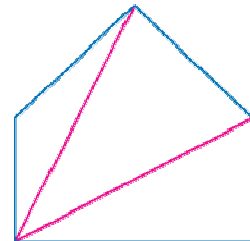
**SAFETY** Find the sum of the angle measures of a school crossing sign.



## Solution

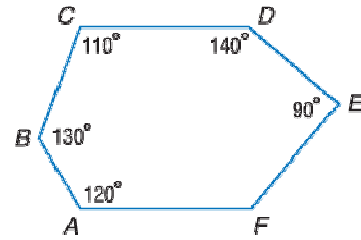
A school crossing sign is a pentagon. When all the diagonals are drawn from one vertex, there are three triangular regions.

Since  $3 \cdot 180^\circ = 540^\circ$  the sum of the angle measures of a school crossing sign is  $540^\circ$ .



**Example 3**

Find  $m\angle F$  in the polygon shown.

**Solution**

Since the polygon can be separated into four triangles, the sum of the angle measures is  $4 \cdot 180^\circ = 720^\circ$ .

$$\begin{aligned} m\angle A + m\angle B + m\angle C + m\angle D + m\angle E + m\angle F &= 720^\circ \\ 120^\circ + m\angle B + 110^\circ + 140^\circ + 90^\circ + m\angle F &= 720^\circ \\ 590^\circ + m\angle B + m\angle F &= 720^\circ \\ m\angle B + m\angle F &= 130^\circ \end{aligned}$$

