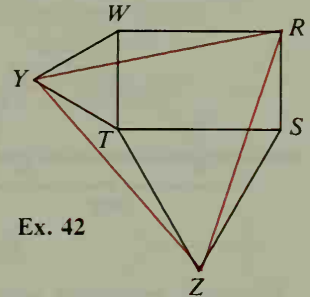


- C** 40. a. Suppose that two sides of a quadrilateral are parallel and that one diagonal bisects an angle. Does that quadrilateral have to be special in other ways? If so, write a proof. If not, draw a convincing diagram.
 b. Repeat part (a) with these conditions: Suppose that two sides are parallel and that one diagonal bisects two angles of the quadrilateral.
41. Draw a regular pentagon $ABCDE$. Let X be the intersection of \overline{AC} and \overline{BD} . What special kind of quadrilateral is $AXDE$? Write a paragraph proof.



42. Given: Rectangle $RSTW$;
 equilateral $\triangle YWT$ and STZ
 What is true of $\triangle RYZ$?
 Write a paragraph proof.

Explorations

These exploratory exercises can be done using a computer with a program that draws and measures geometric figures.

As you will learn in the next section, a *trapezoid* is a quadrilateral with exactly one pair of parallel sides.

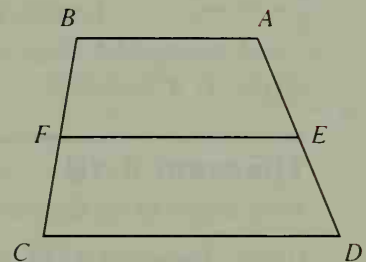
Draw trapezoid $ABCD$ with $\overline{BA} \parallel \overline{CD}$. Label the midpoints of \overline{AD} and \overline{BC} as E and F respectively, and draw \overline{FE} .

Measure $\angle BFE$ and $\angle BCD$. What is true of \overline{CD} and \overline{FE} ? What postulate or theorem tells you this?

What is true of \overline{FE} and \overline{BA} ? Why?

Measure the lengths of \overline{BA} , \overline{CD} , and \overline{FE} . What do you notice?

Write an equation that relates BA , CD , and FE . Repeat the drawing and measurements until you are sure of your equation.



Mixed Review Exercises

Find the average of the given numbers. (The *average* is the sum of the numbers divided by the number of numbers.)

1. 17, 9
2. 15, 25
3. 18, 2, 13
4. 7, 8, 5, 15, 10
5. 7.9, 8.5
6. 4, -7
7. -3, 4, -7, 10
8. 1.7, 2.6, 9.1, 0.4
9. The numbers given are the coordinates of the endpoints of a segment on a number line. Find the coordinate of the midpoint by taking the average.
 - a. 12, 34
 - b. -3, 7
 - c. 17, -9
 - d. -5, -7