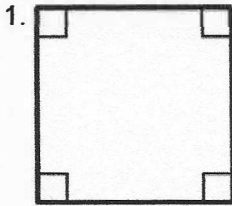


LESSON
9.3

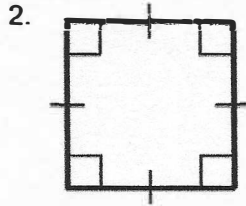
Properties of Rectangles, Rhombuses, and Squares

Practice and Problem Solving: A/B

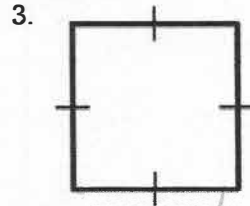
Tell whether each figure is a parallelogram, rectangle, rhombus, or square based on the information given. Use the most specific name possible.



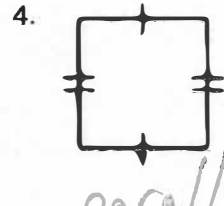
rect.



square



rhomb.



parall.

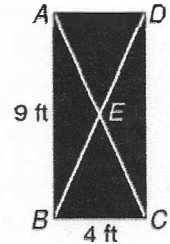
A modern artist's sculpture has rectangular faces. The face shown here is 9 feet long and 4 feet wide. Find each measure in simplest radical form. (Hint: Use the Pythagorean Theorem.)

5. $DC = 9$

6. $AD = 4$

7. $DB = \sqrt{9^2 + 4^2}$
 $= \sqrt{81 + 16}$
 $= \sqrt{97} = 9.8$

8. $AE = \frac{1}{2} \sqrt{97} = 4.9$



VWXY is a rhombus. Find each measure.

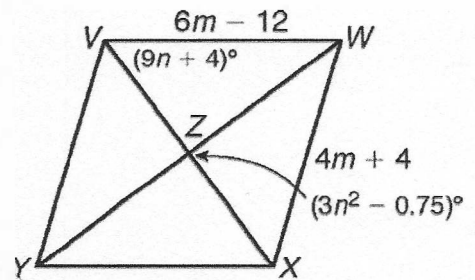
9. $XY = 4(8) + 4 = 36$

10. $m\angle YVW = 107$

$m\angle ZVW = 9(5.5) + 4$
 $= 53.5$

11. $m\angle VYX =$
 $180 - (53.5) \cdot 2$
 $= 73$

12. $m\angle XYZ = \frac{1}{2}(73)$
 $= 36.5$



$3n^2 - 75 = 90$
 $3n^2 = 90.75$
 $n^2 = 30.25$
 $n = 5.5$

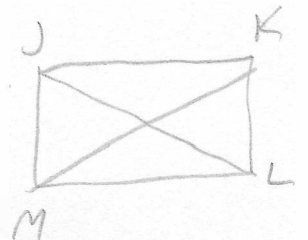
In Exercises 13 and 14, find the lengths of the diagonals of rectangle JKLM.

13. $JL = 3x + 4$
 $KM = 4x - 1$

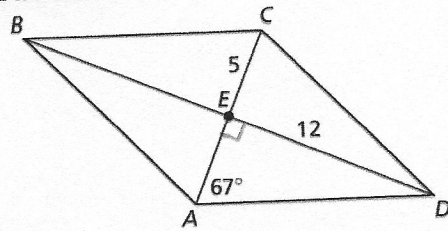
$3x + 4 = 4x - 1$
 $5 = x$
 $JL = 3(5) + 4 = 19$
 $KM = 19$

14. $JL = 2x - 6$

$KM = \frac{3}{2}x + 1$
 $2x - 6 = \frac{3}{2}x + 1$
 $\frac{1}{2}x = 7$
 $x = 14$
 $JL = 2(14) - 6 = 22$
 $KM = 22$



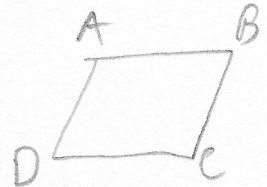
In Exercises 15–19, the diagonals of rhombus $ABCD$ intersect at E . Given that $m\angle EAD = 67^\circ$, $CE = 5$, and $DE = 12$, find the indicated measure.



- 15. $m\angle AED = 90$
- 16. $m\angle ADE = 23$
- 17. $m\angle BAE = 67$
- 18. $AE = 5$
- 19. $BE = 12$

Given rhombus $ABCD$, find the measure of the indicated angle in degrees.

20. $m\angle A = 119^\circ$. Find $m\angle B$. $= 180 - 119 = 61$



Find the length of the diagonals of rectangle $QRST$ given the following information.

21. $QS = 4x + 6$, $RT = 6x - 4$

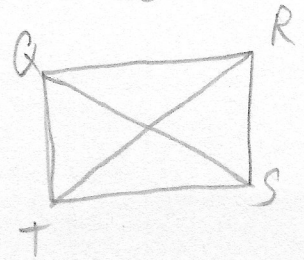
$$4x + 6 = 6x - 4$$

$$10 = 2x$$

$$x = 5$$

$$QS = 4(5) + 6 = 26$$

$$RT = 26$$



22. $QS = 9x + 12$, $RT = 11x - 10$

$$9x + 12 = 11x - 10$$

$$22 = 2x$$

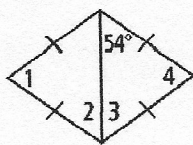
$$x = 11$$

$$QS = 9(11) + 12 = 111$$

$$RT = 111$$

Find the measures of the numbered angles in each rhombus.

23.



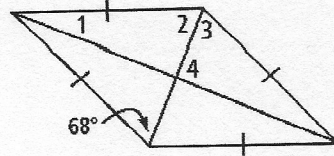
$$m\angle 3 = 54$$

$$m\angle 4 = 180 - 2(54) = 72$$

$$m\angle 2 = 54$$

$$m\angle 1 = 72$$

24.



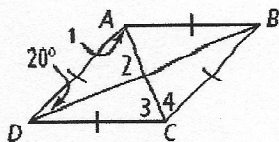
$$m\angle 4 = 90$$

$$m\angle 3 = 68$$

$$m\angle 2 = 68$$

$$m\angle 1 = 90 - 68 = 22$$

25.



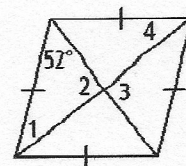
$$m\angle 2 = 90$$

$$m\angle 1 = 90 - 20 = 70$$

$$m\angle 3 = 70$$

$$m\angle 4 = 70$$

26.



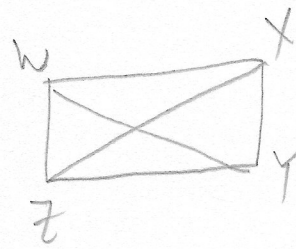
$$m\angle 2 = 90$$

$$m\angle 3 = 90$$

$$m\angle 1 = 90 - 52 = 38$$

$$m\angle 4 = 38$$

In Exercises 27 – 30, find the lengths of the diagonals of rectangle WXYZ.



27. $WY = 6x - 7$
 $XZ = 3x + 2$
 $6x - 7 = 3x + 2$
 $3x = 9$
 $x = 3$
 $WY = 6(3) - 7 = 11$
 $XZ = 11$

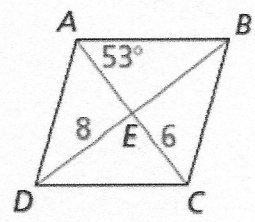
28. $WY = 14x + 10$
 $XZ = 11x + 22$
 $14x + 10 = 11x + 22$
 $3x = 12$
 $x = 4$
 $WY = 14(4) + 10 = 66$
 $XZ = 66$

29. $WY = 24x - 8$
 $XZ = -18x + 13$
 $24x - 8 = -18x + 13$
 $42x = 21$
 $x = \frac{1}{2}$
 $WY = 24(\frac{1}{2}) - 8 = 4$
 $XZ = 4$

30. $WY = 16x + 2$
 $XZ = 36x - 6$
 $16x + 2 = 36x - 6$
 $8 = 20x$
 $x = \frac{2}{5}$
 $WY = 16(\frac{2}{5}) + 2 = 8.4$
 $XZ = 8.4$

In Exercises 31– 36, the diagonals of rhombus ABCD intersect at E. Given that $m\angle BAC = 53^\circ$, $DE = 8$, and $EC = 6$, find the indicated measure.

- 31. $m\angle DAC = 53$
- 32. $m\angle AED = 90$
- 33. $m\angle ADC = 180 - 2(53) = 74$
- 34. $DB = 16$
- 35. $AE = 6$
- 36. $AC = 12$



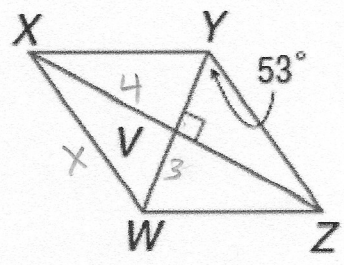
37. Use rhombus XYZW with $m\angle WYZ = 53^\circ$, $VW = 3$, $XV = 2a - 2$, and $ZV = \frac{5a + 1}{4}$

A. Find $m\angle YZV = 90 - 53 = 37$

B. Find $m\angle XYW = 53$

C. Find $XZ = 2(2 \cdot 3 - 2) = 8$

D. Find $XW = 5$



$2a - 2 = \frac{5a + 1}{4}$
 $4(2a - 2) = 5a + 1$
 $8a - 8 = 5a + 1$
 $3a = 9$
 $a = 3$

$3^2 + 4^2 = x^2$
 $9 + 16 = x^2$
 $25 = x^2$
 $x = 5$