Name ______________________ Class ____________ Date ____________

Extra Practice

Chapter 6

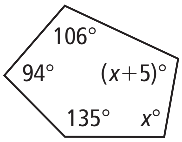
Lesson 6-1

Find the sum of the interior angle measures of each polygon.

1. octagon **1080**　　**2.** 16-gon **2520**　　**3.** 42-gon **7200**

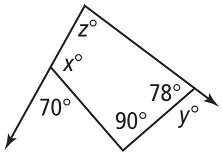
Find the missing angle measures.

4.



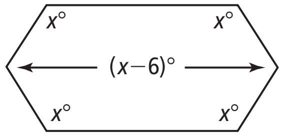
$x = 100$; $(x + 5) = 105$

5.



$x = 110$; $y = 102$; $z = 82$

6.



$x = 122$; $(x - 6) = 116$

Find the measure of one interior angle and the measure of one exterior angle in each regular polygon.

7. nonagon **interior: 140, exterior: 40**

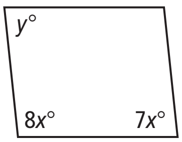
8. 20-gon **interior: 162, exterior: 18**

9. 45-gon **interior: 172, exterior: 8**

Lesson 6-2

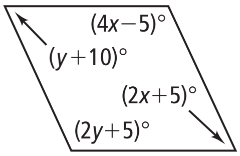
Find the values of the variables in each parallelogram.

10.



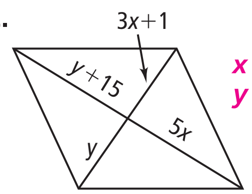
$x = 12$; $y = 84$

11.



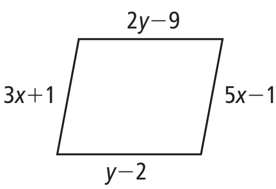
$x = 30$; $y = 55$

12.



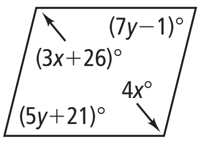
$x = 8$; $y = 25$

13.



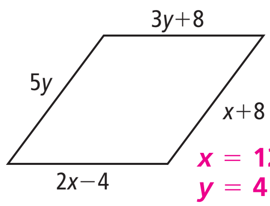
$x = 1$; $y = 7$

14.



$x = 26$; $y = 11$

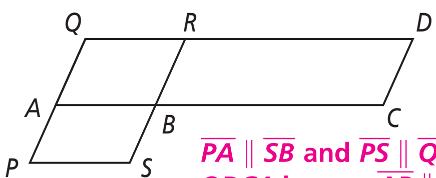
15.



$x = 12$; $y = 4$

16. Given: *PQRS* and *QDCA* are parallelograms.

Prove: $AP = BS$

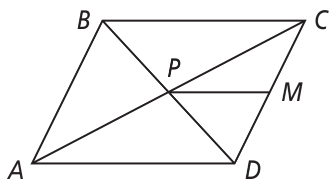


Since *PQRS* is a ▱, its opp. sides are ∥, so $\overline{PA} \parallel \overline{SB}$ and $\overline{PS} \parallel \overline{QR}$. Since *QDCA* is a ▱, $\overline{AB} \parallel \overline{QR}$. Thus, $\overline{PS} \parallel \overline{AB}$ because two lines ∥ to the same line are ∥. *PABS* is a ▱ by def. of ▱, and $AP = BS$ since opp. sides of a ▱ are ≅.

17. Given: ▱*ABCD*

M is the midpoint of $\overline{CD}$.

Prove: $\overline{PM} \parallel \overline{AD}$

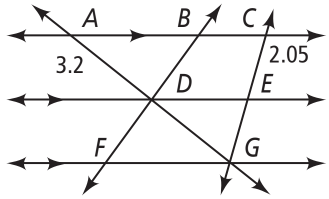


The diagonals of a ▱ bisect each other, so *P* is the midpt. of $\overline{AC}$. *P* and *M* are midpts. of two sides of $\triangle ACD$ so, by the △ Midseg. Thm., $\overline{PM} \parallel \overline{AD}$.

Extra Practice (continued)

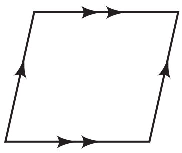
Chapter 6

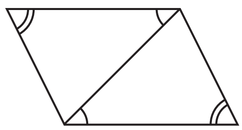
18. In the figure, $\overline{BD} = \overline{DF}$. Find $\overline{DG}$ and $\overline{EG}$.
$\overline{DG} = 3.2$; $\overline{EG} = 2.05$

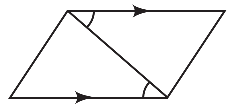


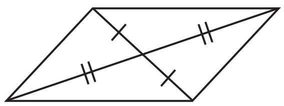
Lesson 6-3

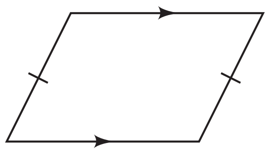
Based on the markings, decide whether each figure must be a parallelogram.

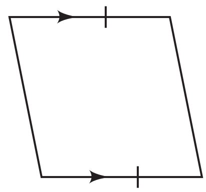
19.  yes

20.  yes

21.  no

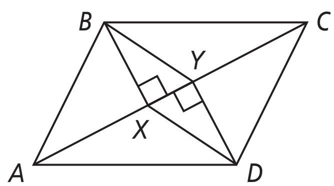
22.  yes

23.  no

24.  yes

25. Describe how you can use what you know about parallelograms to construct a point halfway between a given pair of parallel lines. Sample answer: Mark two ≅ segments on each of the two ∥ lines. The two segments are opposite sides of a ▱. Construct (draw) the diagonals of the ▱. The diagonals intersect at their midpts., which is the desired point halfway between the ∥ lines.

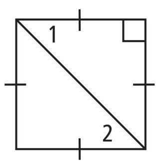
26. Given: ▱*ABCD*
$\overline{BX} \perp \overline{AC}$, $\overline{DY} \perp \overline{AC}$
Prove: *BXDY* is a parallelogram.



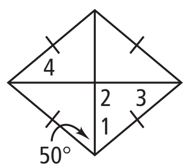
ABCD is a ▱ (given), so $\overline{AB} \parallel \overline{DC}$ and $\overline{AB} \cong \overline{DC}$. ∠*BAX* ≅ ∠*DCY* by the Alt. Int. ∠s Thm. ∠*AXB* and ∠*CYD* are rt. ∠s and therefore ≅. △*AXB* ≅ △*CYD* by AAS and $\overline{BX} \cong \overline{DY}$ by CPCTC. Since $\overline{BX} \perp \overline{AC}$ and $\overline{DY} \perp \overline{AC}$ (given), $\overline{BX} \cong \overline{DY}$. *BXDY* has a pair of sides ∥ and ≅, so *BXDY* is a ▱.

Lessons 6-4 and 6-5

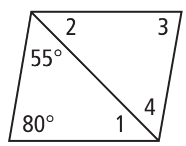
For each parallelogram, determine the most precise name and find the measures of the numbered angles.

27. 

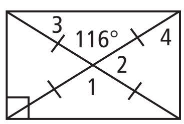
square; $m\angle 1 = 45$; $m\angle 2 = 45$

28. 

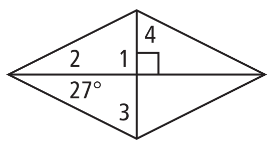
rhombus; $m\angle 1 = 50$; $m\angle 2 = 90$; $m\angle 3 = 40$; $m\angle 4 = 40$

29. 

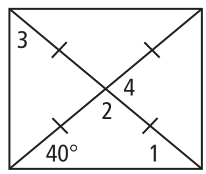
▱; $m\angle 1 = 45$; $m\angle 2 = 45$; $m\angle 3 = 80$; $m\angle 4 = 55$

30. 

rectangle; $m\angle 1 = 116$; $m\angle 2 = 64$; $m\angle 3 = 32$; $m\angle 4 = 58$

31. 

rhombus; $m\angle 1 = 90$; $m\angle 2 = 27$; $m\angle 3 = 63$; $m\angle 4 = 63$

32. 

rectangle; $m\angle 1 = 40$; $m\angle 2 = 100$; $m\angle 3 = 50$; $m\angle 4 = 80$

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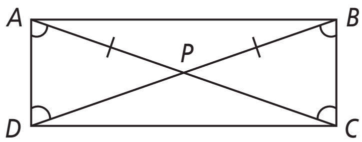
Extra Practice (continued)

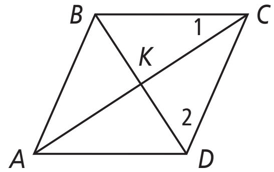
Chapter 6

33. Use the information in the figure. Explain how you know that *ABCD* is a rectangle.



By the Conv. of the Isos. △ Thm. and given that *PA* = *PB*, it follows that *PD* = *PA* = *PB* = *PC*. Thus, the diagonals of *ABCD* bisect each other (so *ABCD* is a ▱) and are ≅ (by the Seg. Add. Post.), so *ABCD* is a rectangle.

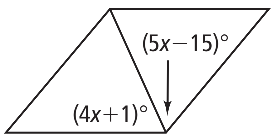
34. ▱*ABCD* is a rhombus. What is the relationship between ∠1 and ∠2? Explain.



∠1 and ∠2 are compl. The diags. of rhombus *ABCD* are ⊥ and bisect each other so the 4 small △*s* are ≅ rt. △*s*. ∠1 and ∠*CBK* are compl., and ∠*CBK* ≅ ∠2, so ∠1 and ∠2 are compl.

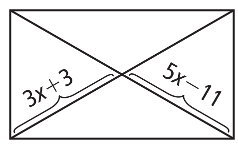
What value of *x* makes each figure the given special parallelogram?

35. rhombus



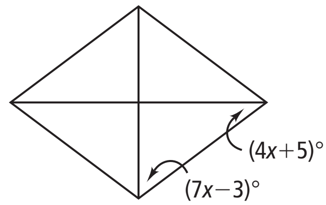
***x* = 16**

36. rectangle



***x* = 7**

37. rhombus

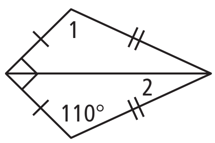


***x* = 8**

Lesson 6-6

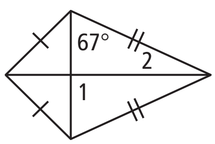
Find *m*∠1 and *m*∠2.

38.



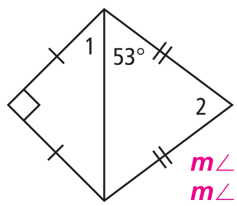
***m*∠1 = 110, *m*∠2 = 25**

39.



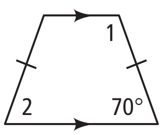
***m*∠1 = 90, *m*∠2 = 23**

40.



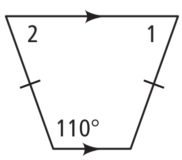
***m*∠1 = 45, *m*∠2 = 74**

41.



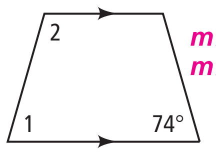
***m*∠1 = 110, *m*∠2 = 70**

42.



***m*∠1 = 70, *m*∠2 = 70**

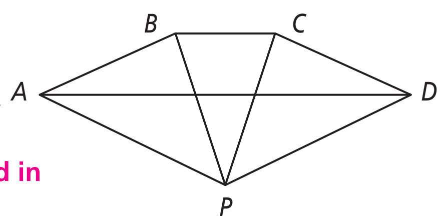
43.



***m*∠1 = 74, *m*∠2 = 106**

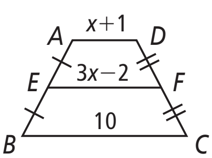
44. Suppose you manipulate the figure so that △*PAB*, △*PBC*, and △*PCD* are congruent isosceles triangles with their vertex angles at point *P*. What kind of figure is *ABCD*? Be sure to consider all the possibilities.

ABCD is an isos. trap. except when *m*∠*APB* = 90, and in that case it is a square.



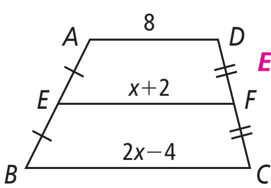
Find *EF* in each trapezoid.

45.



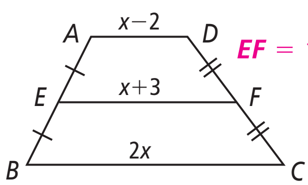
***EF* = 7**

46.



***EF* = 11**

47.



***EF* = 11**

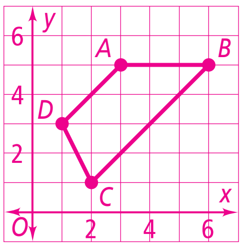
Extra Practice (continued)

Chapter 6

Lesson 6-7

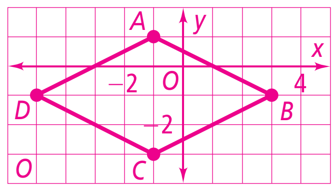
Graph the given points. Use slope and the Distance Formula to determine the most precise name for quadrilateral *ABCD*.

48. $A(3, 5)$, $B(6, 5)$, $C(2, 1)$, $D(1, 3)$



trapezoid

49. $A(-1, 1)$, $B(3, -1)$, $C(-1, -3)$, $D(-5, -1)$

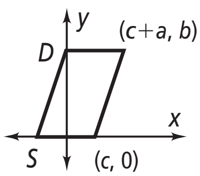


rhombus

Lesson 6-8

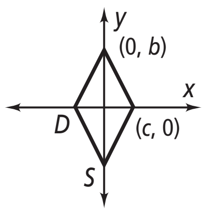
Give coordinates for points *D* and *S* without using any new variables.

50. parallelogram



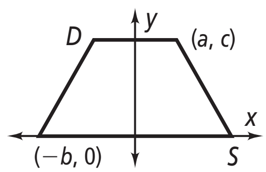
$D(0, b)$; $S(-a, 0)$

51. rhombus



$D(-c, 0)$; $S(0, -b)$

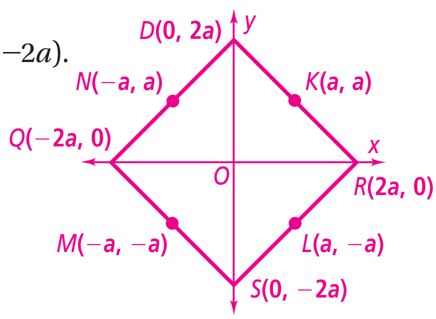
52. isosceles trapezoid



$D(-a, c)$; $S(b, 0)$

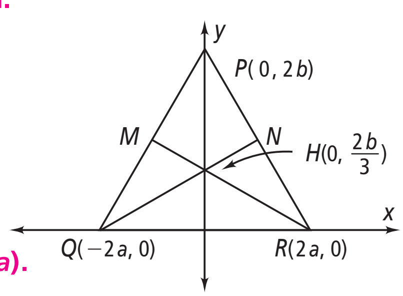
Lesson 6-9

53. A square has vertices at $(2a, 0)$, $(0, 2a)$, $(-2a, 0)$, and $(0, -2a)$. Use coordinate geometry to prove that the midpoints of the sides of a square determine the square.



Given: Square $DRSQ$ with K, L, M, N midpts. of $\overline{DR}$, $\overline{RS}$, $\overline{SQ}$ and $\overline{QD}$, respectively.
Prove: $KLMN$ is a square. $K(a, a)$, $L(a, -a)$, $M(-a, -a)$, and $N(-a, a)$ are midpts. of the sides of the square. $KL = LM = MN = NK = 2a$. The slopes of $\overline{KL}$ and $\overline{MN}$ are undefined. The slopes of $\overline{LM}$ and $\overline{NK}$ are 0, so adj. sides are ⊥ to each other. Since all ∠s are rt. ∠s, the quad. is a rectang. A rectang with all ≅ sides is a square.

54. In the figure, △PQR is an isosceles triangle. Points M and N are the midpoints of $\overline{PQ}$ and $\overline{PR}$, respectively. Give a coordinate proof that the medians of isosceles triangle PQR intersect at $H\left(0, \frac{2b}{3}\right)$.



The line through $R(2a, 0)$ and $M(-a, b)$ is $y = \frac{b}{-3a}(x - 2a)$.

The line through $Q(-2a, 0)$ and $N(a, b)$ is $y = \frac{b}{3a}(x + 2a)$. For each line, when $x = 0$, $y = \frac{2b}{3}$, so the three medians all contain point $H\left(0, \frac{2b}{3}\right)$.