

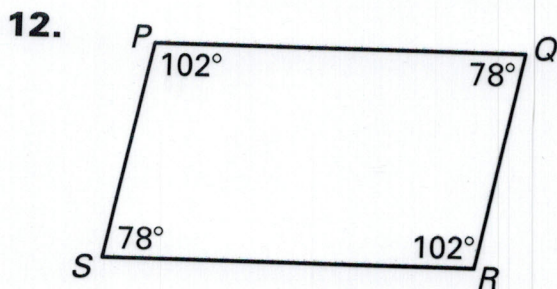
Answers for 8.2

For use with pages 518–521

Pg 518

8.2 Skill Practice

1. A parallelogram is a quadrilateral with both pairs of opposite sides parallel; opposite sides are congruent, opposite angles are congruent, consecutive angles are supplementary, and the diagonals bisect each other.
2. $m\angle B = 115^\circ$ since consecutive angles are supplementary and $m\angle C = 65^\circ$ and $m\angle D = 115^\circ$ since opposite angles are congruent.
3. $x = 9, y = 15$
4. $m = 5, n = 12$
5. $a = 55$
6. $p = 60$
7. $d = 126, z = 28$
8. $g = 61, h = 9$
9. 129°
10. 85°
11. 61°



$$\begin{aligned} m\angle S &= 78^\circ, m\angle P = 102^\circ, \\ m\angle Q &= 78^\circ, m\angle R = 102^\circ \end{aligned}$$

13. $a = 3, b = 10$
14. $m = 4, n = 3$

15. $x = 4, y = 4$

16. A

15. $x = 4, y = 4$
16. A
17. \overline{BC} ; opposite sides of a parallelogram are congruent.
18. $\angle BCD$; opposite angles of a parallelogram are congruent.
19. $\angle DAC$; alternate interior angles are congruent.
20. 47° ; opposite angles of a parallelogram are congruent.
21. 47° ; consecutive angles of a parallelogram are supplementary and alternate interior angles are congruent.
22. 86° ; alternate interior angles are congruent.
23. 120° ; $\angle EJF$ and $\angle FJG$ are a linear pair.
24. 85° ; Alternate Interior Angles Theorem with $\angle HEG$
25. 35° ; Triangle Sum Theorem
26. 45° ; Alternate Interior Angles Theorem with $\angle HGE$
27. 130° ; sum of the measures of $\angle HGE$ and $\angle EGF$
28. 50° ; consecutive angles are supplementary, $\angle HGF$ and $\angle EHG$.

Answers for 8.2 continued

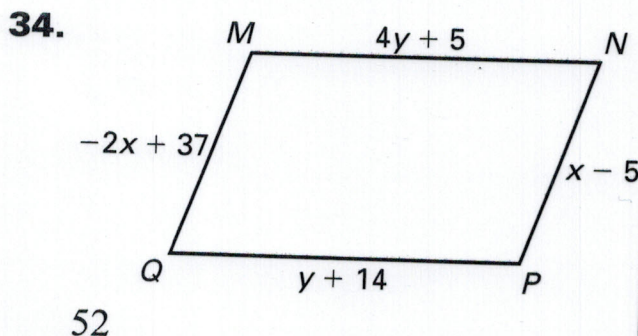
For use with pages 518-521

29. C

30. $36^\circ, 144^\circ$ 31. $26^\circ, 154^\circ$

32. $\angle B$ and $\angle A$ are consecutive angles and thus are supplementary which makes $m\angle A = 130^\circ$.

33. $20, 60^\circ$; $UV = TS = QR$ using the fact that opposite sides are congruent and the Transitive Property of Equality.
 $\angle TUS \cong \angle VSU$ by the Alternate Interior Angles Congruence Theorem and $m\angle TSU = 60^\circ$ by the Triangle Sum Theorem.



35. *Sample answer:* In a parallelogram, opposite angles are congruent. $\angle A$ and $\angle C$ are opposite angles but not congruent.

36. 16°

p. 521 Quiz

1) 121

2) 142

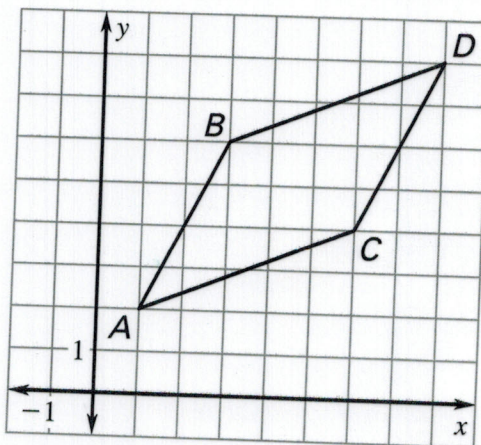
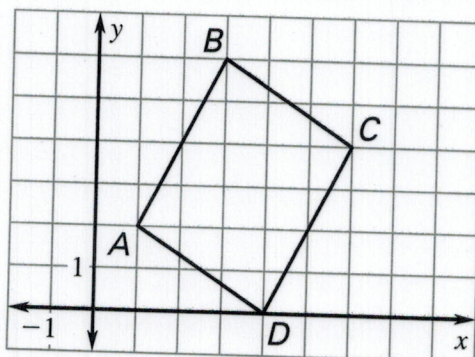
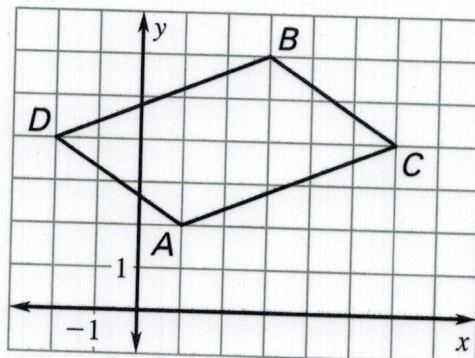
3) 112

4) $x=4, y=3$

5) $x=9, y=5$

6) $a=95, b=85$

37. $(-2, 4), (4, 0), (8, 8);$



In each quadrilateral each pair of opposite sides is parallel.

Answers for 8.2 continued

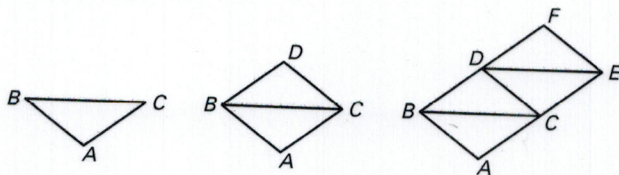
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8.2 Problem Solving

38. 140° ; $\angle C$ and $\angle D$ are consecutive angles and therefore are supplementary.
39. a. 3 in.
b. 70°
c. It decreases; it gets longer; the sum of the measures of the interior angles always is 360° . As $m\angle Q$ increases so does $m\angle S$ therefore $m\angle P$ must decrease to maintain the sum of 360° . As $m\angle Q$ decreases $m\angle P$ increases, moving Q farther away from S .

40. 8

41. Sample:



Since $\triangle ABC \cong \triangle DCB$ you know $\angle ACB \cong \angle DBC$ and $\angle ABC \cong \angle DCB$. Using the Alternate Interior Angles Converse, $\overline{BD} \parallel \overline{AC}$ and $\overline{AB} \parallel \overline{CD}$ thus making $ABDC$ a parallelogram. If two more triangles are positioned the same as the first, you can line up the pair of congruent sides and form a larger parallelogram because both

pairs of alternate interior angles are congruent. Using the Alternate Interior Angles Converse, opposite sides are parallel.

42. Statements (Reasons)

- $ABCD$ is a parallelogram.
(Given)
- $\overline{BD} \parallel \overline{AC}$, $\overline{AB} \parallel \overline{CD}$
(Definition of a parallelogram)
- $\angle CBD \cong \angle ADB$,
 $\angle CDB \cong \angle ADB$
(Alternate Interior Angles Congruence Theorem)
- $\overline{BD} \cong \overline{BD}$
(Reflexive Property of Segment Congruence)
- $\triangle ABD \cong \triangle CDB$
(ASA)
- $\angle A \cong \angle C$, $\angle B \cong \angle D$
(Corr. parts of $\cong \triangle$ are \cong .)

43. Sample answer: Given that $PQRS$ is a parallelogram you know that $\overline{QR} \parallel \overline{PS}$ with \overline{QP} being a transversal. By definition and the fact that they are consecutive interior angles, $\angle Q$ and $\angle P$ are supplementary using the Consecutive Interior Angles Theorem. So $x^\circ + y^\circ = 180^\circ$ by the definition of supplementary angles.

Answers for 8.2 continued

For use with pages 518–521

44. Statements (Reasons)

1. $PQRS$ is a parallelogram.
(Given)

2. $\overline{PQ} \cong \overline{RS}$, $\overline{QR} \cong \overline{SP}$
(If a quadrilateral is a parallelogram, then its opposite sides are congruent.)

3. $\angle QPR \cong \angle SRP$,
 $\angle PQS \cong \angle RSQ$,
 $\angle RPS \cong \angle QRP$,
 $\angle PSQ \cong \angle RQS$
(Alternate Interior Angles Congruence Theorem)

4. $\triangle PMQ \cong \triangle RMS$,
 $\triangle QMR \cong \triangle SMP$ (ASA)

5. $\overline{QM} \cong \overline{SM}$, $\overline{PM} \cong \overline{RM}$
(Corr. parts of $\cong \triangle$ s are \cong .)

6. M bisects \overline{QS} and \overline{PR} .
(Definition of segment bisector)

45. Sample answer: $\triangle DCG \sim \triangle ACF$ and $\triangle DAE \sim \triangle ACF$ using the AA Similarity Postulate.

$$\frac{DG}{AF} = \frac{DC}{AC} \text{ and } \frac{DE}{AF} = \frac{DA}{AC} \text{ since the}$$

ratio of corresponding sides of similar triangles are equal.

Adding you get

$$\frac{DE}{AF} + \frac{DG}{AF} = \frac{DA}{AC} + \frac{DC}{AC}, \text{ which}$$

implies

$$\frac{DE + DG}{AF} = \frac{DA + DC}{AC}, \text{ which}$$

$$\text{implies } \frac{DE + DG}{AF} = \frac{AC}{AC}, \text{ which}$$

$$\text{implies } \frac{DE + DG}{AF} = 1, \text{ which}$$

$$\text{implies } DE + DG = AF.$$

Pg 521

8.2 Mixed Review

46. Neither; the slope of line 1 is $-\frac{3}{2}$
and the slope of line 2 is $-\frac{7}{4}$.

47. Parallel; the slope of both lines is -1 .

48. Neither; the slope of line 1 is $-\frac{5}{3}$
and the slope of line 2 is $-\frac{5}{2}$.

49. triangle; obtuse

50. triangle; acute

51. triangle; right

52. not a triangle

53. triangle; right

54. triangle; acute

55. $4\sqrt{3}$

56. 30

57. $4\sqrt{2}$