Chapter 6 Answers

Practice 6-1

1. parallelogram **2.** rectangle **3.** quadrilateral **4.** parallelogram, quadrilateral **5.** kite, quadrilateral **6.** rectangle, parallelogram, quadrilateral **7.** trapezoid, isosceles trapezoid, quadrilateral **8.** square, rectangle, parallelogram, rhombus, quadrilateral **9.** $x = 7$; $AB = BD = DC = CA = 11$ **10.** $m = 9; s = 42$; $ON = LM = 26; OL = MN = 43$ **11.** $f = 5; g = 11$; $FG = GH = HI = IF = 17$ **12.** parallelogram **13.** rectangle **14.** kite **15.** parallelogram

Practice 6-2

1. 15 **2.** 32 **3.** 7 **4.** 8 **5.** 12 **6.** 9 **7.** 8 **8.** $3\frac{5}{8}$ **9.** 54 **10.** 34 **11.** 54 **12.** 34 **13.** 100 **14.** 40; 140; 40 **15.** 70; 110; 70 **16.** 113; 45; 22 **17.** 115; 15; 50 **18.** 55; 105; 55 **19.** 61; 72; 108; 32 **20.** 32; 98; 50 **21.** 16 **22.** 35 **23.** 28 **24.** 4

Practice 6-3

1. no **2.** yes **3.** yes **4.** no **5.** yes **6.** yes **7.** $x = 2; y = 3$ **8.** $x = 6; y = 3$ **9.** $x = 64$; $y = 10$ **10.** $x = 8$; the figure is a ▱ because both pairs of opposite sides are congruent. **11.** $x = 40$; the figure is not a ▱ because one pair of opposite angles is not congruent. **12.** $x = 25$; the figure is a ▱ because the congruent opposite sides are $\parallel$ by the Converse of the Alternate Interior Angles Theorem. **13.** Yes; the diagonals bisect each other. **14.** No; the congruent opposite sides do not have to be $\parallel$. **15.** No; the figure could be a trapezoid. **16.** Yes; both pairs of opposite sides are congruent. **17.** Yes; both pairs of opposite sides are $\parallel$ by the converse of the Alternate Interior Angles Theorem. **18.** No; only one pair of opposite angles is congruent. **19.** Yes; one pair of opposite sides is both congruent and $\parallel$. **20.** No; only one pair of opposite sides is congruent.

Practice 6-4

1a. rhombus **1b.** 72; 54; 54; 72 **2a.** rectangle **2b.** 72; 36; 18; 144 **3a.** rectangle **3b.** 37; 53; 106; 74 **4a.** rhombus **4b.** 59; 90; 90; 59 **5a.** rectangle **5b.** 60; 30; 60; 30 **6a.** rhombus **6b.** 22; 68; 68; 90 **7.** Yes; the parallelogram is a rhombus. **8.** Possible; opposite angles are congruent in a parallelogram. **9.** Impossible; if the diagonals are perpendicular, then the parallelogram should be a rhombus, but the sides are not of equal length. **10.** $x = 7; HJ = 7; IK = 7$ **11.** $x = 7; HJ = 26; IK = 26$ **12.** $x = 6$; $HJ = 25; IK = 25$ **13.** $x = -3; HJ = 13; IK = 13$ **14a.** 90; 90; 29; 29 **14b.** 288 cm^2 **15a.** 70; 90; 70; 70 **15b.** 88 in.^2 **16a.** 38; 90; 90; 38 **16b.** 260 m^2 **17.** possible **18.** Impossible; because opposite angles are congruent and supplementary, for the figure to be a parallelogram they must measure 90, the figure therefore must be a rectangle.

Practice 6-5

1. 118; 62 **2.** 99; 81 **3.** 59; 121 **4.** 96; 84 **5.** 101; 79 **6.** 67; 113 **7.** $x = 4$ **8.** $x = 16$; $y = 116$ **9.** $x = 1$ **10.** 105.5; 105.5 **11.** 90; 25 **12.** 118; 118 **13.** 90; 63; 63 **14.** 107; 107 **15.** 90; 51; 39 **16.** $x = 8$ **17.** $x = 7$ **18.** $x = 28; y = 32$

Practice 6-6

1. $(1.5a, 2b); a$ **2.** $(1.5a, b); \sqrt{a^2 + 4b^2}$ **3.** $(0.5a, 0); a$ **4.** $(0.5a, b); \sqrt{a^2 + 4b^2}$ **5.** 0 **6.** 1 **7.** $-\frac{1}{2}$ **8.** 2 **9.** $\frac{2b}{3a}$ **10.** $-\frac{2b}{3a}$ **11.** $\frac{2b}{3a}$ **12.** $-\frac{2b}{3a}$ **13.** $E(a, 3b); I(4a, 0)$ **14.** $O(3a, 2b); M(3a, -2b)$; $E(-3a, -2b)$ **15.** $D(4a, b); I(3a, 0)$ **16.** $T(0, 2b)$; $A(a, 4b); L(2a, 2b)$ **17.** $(-4a, b)$ **18.** $(-b, 0)$

Practice 6-7

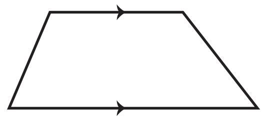
1a. $\frac{p}{q}$ **1b.** $y = mx + b; q = \frac{p}{q}(p) + b; b + q - \frac{p^2}{q}$; $y = \frac{p}{q}x + q - \frac{p^2}{q}$ **1c.** $x = r + p$ **1d.** $y = \frac{p}{q}(r + p) + q - \frac{p^2}{q}; y = \frac{rp}{q} + \frac{p^2}{q} + q - \frac{p^2}{q}; y = \frac{rp}{q} + q;$ intersection at $(r + p, \frac{rp}{q} + q)$ **1e.** $\frac{r}{q}$ **1f.** (r, q) **1g.** $y = mx + b; q = \frac{r}{q}(r) + b; b = q - \frac{r^2}{q}$; $y = \frac{r}{q}x + q - \frac{r^2}{q}$ **1h.** $y = \frac{r}{q}(r + p) + q - \frac{r^2}{q}$; $y = \frac{r^2}{q} + \frac{rp}{q} + q - \frac{r^2}{q}; y = \frac{rp}{q} + q;$ intersection at $(r + p, \frac{rp}{q} + q)$ **1i.** $(r + p, \frac{rp}{q} + q)$ **2a.** $(-2a, 0)$ **2b.** $(-a, b)$ **2c.** $(-\frac{3a}{2}, \frac{b}{2})$ **2d.** $\frac{b}{a}$ **3a.** $(-4a, 0)$ **3b.** $(-2a, 3a)$ **3c.** $\frac{3}{2}$ **3d.** $(2a, -a)$ **3e.** $\frac{1}{2}$ **4.** The coordinates for D are $(0, 2b)$. The coordinates for C are $(2a, 0)$. Given these coordinates, the lengths of $\overline{DC}$ and $\overline{HP}$ can be determined:

$DC = \sqrt{(2a - 0)^2 + (0 - 2b)^2} = \sqrt{4a^2 + 4b^2}$;
$HP = \sqrt{(0 - 2a)^2 + (0 - 2b)^2} = \sqrt{4a^2 + 4b^2}$;
$DC = HP$, so $\overline{DC} \cong \overline{HP}$.

Reteaching 6-1

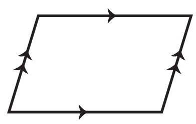
1.–4. Samples:

1.



trapezoid

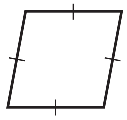
2.



parallelogram

3.

rectangle

4. 

rhombus

5. parallelogram 6. rectangle 7. isosceles trapezoid 8. rhombus 9. trapezoid 10. kite 11. rectangle 12. square

Reteaching 6-2

1.

Statements	*Reasons*
1. Parallelogram $ABCD$	1. Given
2. $\overline{AB} \cong \overline{CD}$, $\overline{BC} \cong \overline{DA}$	2. Opposite sides of a parallelogram are congruent.
3. $\overline{BD} \cong \overline{DB}$	3. Reflexive Prop. of $\cong$
4. $\triangle ABD \cong \triangle CDB$	4. SSS
5. $\angle A \cong \angle C$	5. CPCTC

2.

Statements	*Reasons*
1. Parallelogram $ACDE$; $\overline{CD} \cong \overline{BD}$	1. Given
2. $\angle C \cong \angle E$	2. Opposite angles of a parallelogram are $\cong$.
3. $\angle CBD \cong \angle C$	3. Isosceles Triangle Theorem
4. $\angle CBD \cong \angle E$	4. Substitution

3.

Statements	*Reasons*
1. Parallelogram $ACDE$; $\overline{AE} \cong \overline{BD}$	1. Given
2. $\overline{AE} \cong \overline{CD}$	2. Opposite sides of a parallelogram are $\cong$.
3. $\overline{CD} \cong \overline{BD}$	3. Substitution
4. $\angle CBD \cong \angle C$	4. Isosceles Triangle Theorem

4.

Statements	*Reasons*
1. Parallelogram $ACDE$; $\angle CBD \cong \angle E$	1. Given
2. $\angle E \cong \angle C$	2. Opposite angles of a parallelogram are $\cong$.
3. $\angle CBD \cong \angle C$	3. Substitution
4. $\overline{CD} \cong \overline{BD}$	4. If 2 $\angle$s of a $\triangle$ are $\cong$, sides opposite them are $\cong$.
5. $\triangle BDC$ is isosceles.	5. Def. of isosceles triangle

5.

Statements	*Reasons*
1. Isosceles trap. $ABDE$; $\angle C \cong \angle E$	1. Given
2. $\overline{AE} \cong \overline{BD}$; $\angle E \cong \angle BDE$	2. Definition of isosceles trapezoid
3. $\angle C \cong \angle BDE$	3. Transitive Property
4. $\angle CBD \cong \angle BDE$	4. Alt. int. $\angle$'s are $\cong$.
5. $\angle C \cong \angle CBD$	5. Transitive Property
6. $\triangle BCD$ is isosceles.	6. Definition of isosceles triangle
7. $\overline{BD} \cong \overline{CD}$	7. Definition of isosceles triangle
8. $\overline{AE} \cong \overline{CD}$	8. Transitive Property

Reteaching 6-3

1. no 2. no 3. no 4. yes

5.

Statements	*Reasons*
1. $\overline{BD} \cong \overline{CD}$, $\overline{AE} \cong \overline{BD}$, $\overline{AE} \parallel \overline{CD}$	1. Given
2. $\overline{AE} \cong \overline{CD}$	2. Substitution
3. $ACDE$ is a parallelogram.	3. If one pair of opposite sides is both congruent and parallel, then the quadrilateral is a parallelogram.

6.

Statements	*Reasons*
1. $\angle CBD \cong \angle C$, $\overline{AE} \cong \overline{BD}$, $\overline{AC} \cong \overline{ED}$	1. Given
2. $\overline{BD} \cong \overline{CD}$	2. If 2 $\angle$s of a $\triangle$ are $\cong$, sides opposite them are $\cong$.
3. $\overline{AE} \cong \overline{CD}$	3. Substitution
4. $ACDE$ is a parallelogram.	4. If both pairs of opposite sides are $\cong$, then the quad. is a parallelogram.

Reteaching 6-4

1. $m\angle 1 = 60$; $m\angle 2 = 30$; $m\angle 3 = 90$ 2. $m\angle 1 = 80$; $m\angle 2 = 50$; $m\angle 3 = 50$; $m\angle 4 = 100$ 3. $m\angle 1 = 80$; $m\angle 2 = 100$; $m\angle 3 = 40$; $m\angle 4 = 40$ 4. $m\angle 1 = 60$; $m\angle 2 = 60$; $m\angle 3 = 60$ 5. $m\angle 1 = 75$; $m\angle 2 = 75$; $m\angle 3 = 15$; $m\angle 4 = 90$ 6. $m\angle 1 = 45$; $m\angle 2 = 45$

Reteaching 6-5

1. 90 2. 52 3. 90 4. 38 5. 52 6. 90 7. 27 8. 63 9. 27

10. Sample:

Statements	*Reasons*
1. $\overline{LP} \cong \overline{MN}$	1. Given
2. $\angle LPN \cong \angle MNP$	2. Theorem 6-15
3. $\overline{PN} \cong \overline{PN}$	3. Reflexive Prop. of $\cong$
4. $\triangle LNP \cong \triangle MPN$	4. SAS Postulate
5. $\overline{PM} \cong \overline{LN}$	5. CPCTC
6. $\overline{LM} \cong \overline{LM}$	6. Reflexive Prop. of $\cong$
7. $\triangle PLM \cong \triangle NML$	7. SSS Postulate
8. $\angle LPQ \cong \angle MNQ$	8. CPCTC
9. $\angle LQP \cong \angle MQN$	9. Vertical angles are $\cong$.
10. $\triangle LQP \cong \triangle MQN$	10. AAS Theorem

11. 87 12. 48 13. 45 14. 48 15. 24 16. 24 17. 132 18. 24 19. 132 20. Sample: Both $\triangle LMQ$ and $\triangle PNQ$ have the same angle measures, but their sides have different lengths.

Reteaching 6-6

1. $Q(x + k, m)$ 2. $X(-a, 0)$; $W(0, -b)$ 3. $S(a, -a)$; $T(0, -a)$ 4. Each side has length $a\sqrt{2}$, so it is a rhombus. One pair of opposite sides has slope of 1, and the other pair has slope of -1. Therefore, because $(1)(-1) = -1$, the rhombus has four right angles and is a square. 5. Each side

has length of $\sqrt{2a^2 + 2a + 1}$. Therefore, the figure is a rhombus. **6.** $C(x - k, m)$

Reteaching 6-7

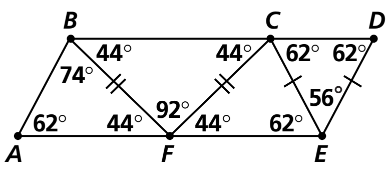
1. Each diagonal has length $\sqrt{c^2 + (b + a)^2}$. **2.** The midpoints are $(\frac{b}{2}, \frac{c}{2})$ and $(\frac{b + a}{2}, \frac{c}{2})$. The line connecting the midpoints has slope of 0 and is therefore parallel to the third side. **3.** The midpoints are $(\frac{a}{2}, 0)$, $(a, \frac{b}{2})$, $(\frac{a}{2}, b)$ and $(0, \frac{b}{2})$. The segments joining the midpoints each have length $\frac{1}{2}\sqrt{a^2 + b^2}$. **4.** The midpoints are $(\frac{a}{2}, \frac{b}{2})$, $(-\frac{a}{2}, \frac{b}{2})$, $(-\frac{a}{2}, -\frac{b}{2})$, and $(\frac{a}{2}, -\frac{b}{2})$. The quadrilateral formed by these points has sides with slopes of 0, 0, undefined, and undefined. Therefore, the sides are vertical and horizontal, and consecutive sides are perpendicular. **5.** The median meets the base at (0, 0), the midpoint of the base. Therefore, the median has undefined slope; i.e., it is vertical. Because the base is a horizontal segment, the median is perpendicular to the base. **6.** The midpoints are $(\frac{a}{2}, 0)$, $(\frac{a + d}{2}, \frac{e}{2})$, $(\frac{b + d}{2}, \frac{c + e}{2})$, and $(\frac{b}{2}, \frac{c}{2})$. One pair of opposite sides has slope of $\frac{e}{d}$, and the other pair of opposite sides has slope of $\frac{c}{b - a}$. Therefore, the figure is a parallelogram because opposite sides are parallel.

Enrichment 6-1

1. Some **2.** No **3.** Some **4.** All **5.** No
6. Some **7.** No **8.** Some **9.** All **10.** Some
11. Some **12.** No **13.** No **14.** Some **15.** All
16. All **17.** Some **18.** No **19.** Some **20.** All

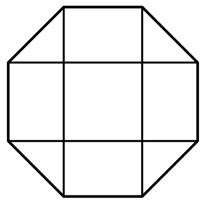
Enrichment 6-2

1. *ABED, BCFE, DEHG, EFIH, ACIG, DBFH*
2. *ABED, BCFE, DEHG, EFIH, ACIG, DBFH, ACFD, DFIG, ABHG, BCIH* **3.** *ABED, BCFE, DEHG, EFIH, ACIG, DBFH, ACFD, DFIG, ABHG, BCIH, AEHD, DBEG, BFIE, ECFH, BFEA, BCED, EFHG, DEIH* **4.** *DBHG, ECIH, ADEC, EACF, ABHD, BCIE, HDFI, GDFH, BCGD, GCFH, DAIH, ABFI*
5. pentagon, scalene triangle, two rectangles, two trapezoids, two isosceles right triangles
6.



Enrichment 6-3

1a. Given **1b.** Definition of a regular hexagon
1c. SAS **1d.** CPCTC **1e.** Given any two distinct points, there is a unique line segment with these points as endpoints. **1f.** Definition of a diagonal **1g.** Definition of a regular hexagon **1h.** Reflexive Property of Congruence **1i.** SSS **1j.** CPCTC **1k.** If two lines and a transversal form alternate interior angles that are congruent, then the two lines are parallel. **1l.** Definition of a regular hexagon **1m.** SAS **1n.** CPCTC **1o.** Definition of a regular hexagon **1p.** SSS **1q.** CPCTC **1r.** If two lines and a transversal form alternate interior angles that are congruent, then the two lines are parallel. **1s.** Definition of a parallelogram
2. A parallelogram can be constructed in an octagon by drawing the diagonals as shown. Other answers are possible.

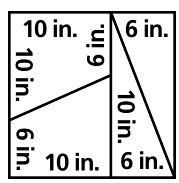


Enrichment 6-4

1. 2.24 cm; *JBCK* is a square, so $BC = BJ = 2.4$ cm. Because $AJ = AB - BJ$, $AJ = 4.64 - 2.4 = 2.24$ cm.
2. 44; *LMNO* is a rhombus, so $\overline{MO} \perp \overline{LN}$. So $m\angle MRL = 90$ and $m\angle MLR = 46$; therefore $m\angle MLR = 44$. **3.** 2.24 cm; because $m\angle AML = 46 = m\angle MLR$, $\overline{AJ} \parallel \overline{LN}$. So *AJLN* is a parallelogram, and $AJ = LN = 2.24$ cm. **4.** 2.4 cm; because $m\angle MLA = 44 = m\angle LMR$, $\overline{AD} \parallel \overline{MO}$. *AMOD* therefore is a parallelogram, so $MO = AD = 2.4$ cm. **5.** 44; because $m\angle LMR = m\angle RMN$, $m\angle RMN = 44$. **6.** 90; because *JBCK* is a square, $m\angle BJK = 90$. Because $m\angle BJK + m\angle NJM = 180$, $m\angle NJM = 90$. **7.** 88; $m\angle LMR + m\angle RMN = m\angle LMN = 88$. **8.** No; the base angles of the triangle are not congruent. **9.** parallelogram **10.** rhombus **11.** square **12.** rectangle

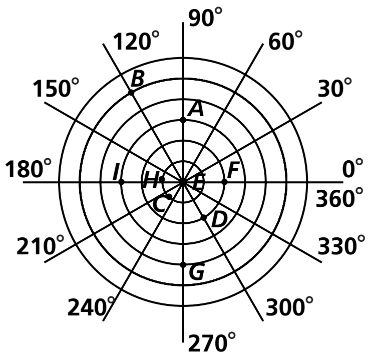
Enrichment 6-5

1. 64 square units **2.** 65 square units **3.** When you actually cut out the shapes and reassemble them, you find that the "diagonal" of the rectangle is not a straight line. Trapezoid IV does not quite meet the top edge of triangle I, and similarly there is a space between trapezoid III and triangle II. The extra space represents the extra one square unit of area.
4. The areas differ by 4 square inches.



Enrichment 6-6

1.–9.



10. (5; 60°) **11.** (1; 300°) **12.** (3.5; 225°) **13.** (6; 150°) **14.** (4; 315°) **15.** (5; 120°) **16.** (2; 90°) **17.** (5; 255°) **18.** (1; 180°)

Enrichment 6-7

1. (0, 7) **2.** (0, 1) **3.** (5, 1) **4.** (5, 7) **5.** The x-coordinate of each point decreased by 4. **6.** (7, 0) **7.** (−3, −5) **8.** (−1.5, −2.5) **9.** Add 3 to the y-coordinate. **10.** The y-coordinate of each point decreased by 3. **11.** The y-coordinate decreased by 3. **12.** (3, 4) **13.** $M(10, 6)$, $N(2, 6)$ **14.** rectangle **15.** Either all the x-coordinates or all the y-coordinates change by a constant amount.

Chapter Project

Activity 1: Doing
Check students' work.

Activity 2: Analyzing
1. The effective area is rectangular.
2. The effective area is rectangular. The effective area is larger in Figure 2 than in Figure 1 because the diagonal is longer than the face.
3. You should tie the string to a vertical stick of the kite.
4. If the faces of the kite were unchanged, one diagonal of the rhombus is longer than the diagonals of the square, so the effective area would increase.

Activity 3: Researching
Check students' work.

✔ Checkpoint Quiz 1

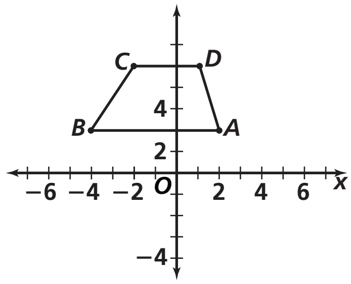
1. 70, 110, 70 **2.** 53, 53, 52 **3.** 96, 84, 46 **4.** square **5.** $x = 20, y = 3$ **6.** $x = 2, y = 5$ **7.** 30.5

✔ Checkpoint Quiz 2

1. $x = 66, y = 57$ **2.** $x = 35, y = 35$ **3.** $x = 3, y = 4$ **4.** True; they are the only quadrilaterals that possess these properties. **5.** False; only two triangles at a time are congruent. **6.** $(n + 1, m)$ **7.** $(k, 0)$

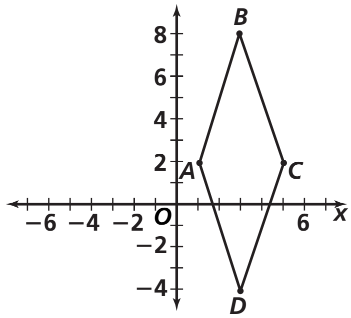
Chapter Test, Form A

1.



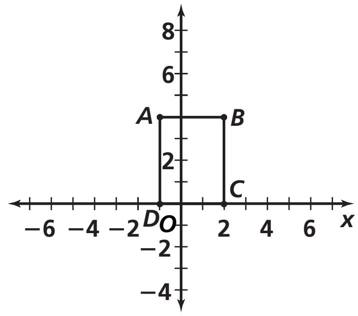
trapezoid

2.



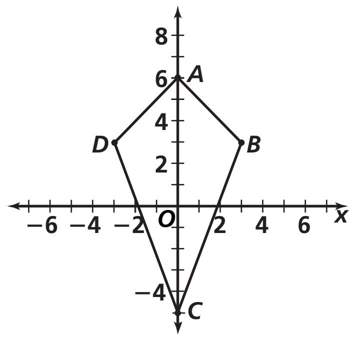
rhombus

3.



rectangle

4.

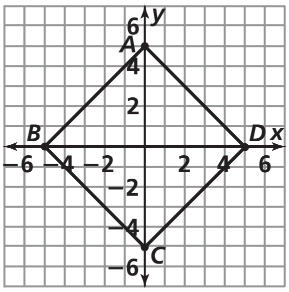


kite

5. 5 cm **6.** 3 in. **7.** 4 m **8.** 20 **9.** $x = 33$; $y = 81$ **10.** 10 **11.** 20 **12.** $x = 30$; $y = 30$ **13.** 12 **14.** $D(a, 0)$; $E(b, c)$; $(\frac{a+b}{2}, \frac{c}{2})$ **15.** $D(-c, 0)$; $E(0, b)$; $(-\frac{c}{2}, \frac{b}{2})$ **16.** $D(0, b)$; $E(a, 0)$; $(\frac{a}{2}, \frac{b}{2})$ **17.** 28; 28 **18.** 105; 75 **19.** 90; 48 **20.** 55; 90 **21.** 22; 68 **22.** 53; 37 **23.** The lengths of segments $\overline{AB}$, $\overline{BC}$, and $\overline{AC}$ are: $AB = \sqrt{j^2 + k^2}$, $BC = \sqrt{k^2 + l^2}$, $AC = l + j$. Thus, the perimeter of $\triangle ABC$ is $l + j + \sqrt{j^2 + k^2} + \sqrt{k^2 + l^2}$. The midpoints of segments $\overline{AB}$, $\overline{BC}$, and $\overline{AC}$ are: $M\left(-\frac{j}{2}, \frac{k}{2}\right)$, $N\left(\frac{l}{2}, \frac{k}{2}\right)$, $O\left(\frac{l-j}{2}, 0\right)$. The lengths of segments $\overline{MN}$, $\overline{NO}$, and $\overline{MO}$ are: $MN = \frac{1}{2}(l + j)$, $NO = \frac{1}{2}\sqrt{j^2 + k^2}$, $MO = \frac{1}{2}\sqrt{k^2 + l^2}$. Thus, the perimeter of $\triangle MNO$ is $\frac{1}{2}(l + j + \sqrt{j^2 + k^2} + \sqrt{k^2 + l^2})$, which is half the perimeter of $\triangle ABC$. **24.** parallelogram **25.** kite **26.** rectangle **27.** parallelogram **28.** square **29.** rhombus **30.** isosceles trapezoid

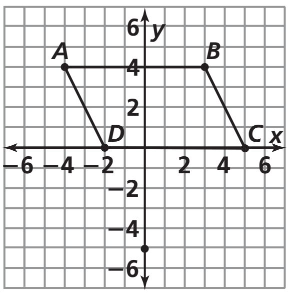
Chapter Test, Form B

1.



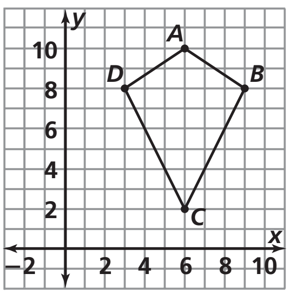
square

2.



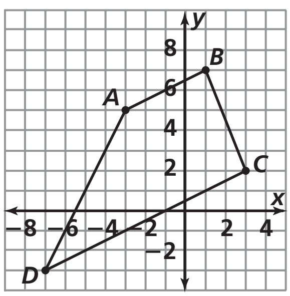
parallelogram

3.



kite

4.



trapezoid

5. 7 in. **6.** 6 cm **7.** 22 m **8.** $x = 3.5$ **9.** $x = 19; y = 123$ **10.** $x = 6$ **11.** 78; 102 **12.** 90; 61 **13.** 64; 128 **14.** 90; 63; 27 **15.** 90; 45; 45 **16.** 71; 71; 38 **17.** parallelogram **18.** rhombus **19.** trapezoid **20.** square

Alternative Assessment, Form C

TASK 1: Scoring Guide

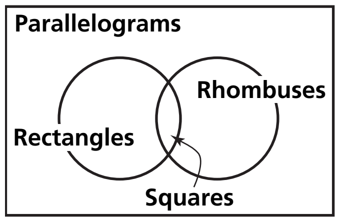
Samples:

a. $\overline{AB} \cong \overline{CD}$, $\overline{BC} \cong \overline{AD}$, $\overline{AB} \parallel \overline{CD}$, $\overline{BC} \parallel \overline{AD}$, $\angle ABD \cong \angle BDC$, $\angle ACD \cong \angle BAC$, $\angle CBD \cong \angle BDA$, $\angle CAD \cong \angle BCA$, $BE = ED$, $AE = EC$, $\angle ABC \cong \angle CDA$, $\angle BCD \cong \angle BAD$,

b. C, E, F

3 Student lists all statements accurately in part a and gives the correct answers in part b.
2 Student gives mostly correct answers but with some errors.
1 Student gives answers that fail to demonstrate understanding of the properties of parallelograms.
0 Student makes little or no effort.

TASK 2: Scoring Guide



3 Student gives accurate and complete answers and diagram.
2 Student gives answers and a diagram that are mostly accurate.
1 Student gives answers or a diagram containing significant errors.
0 Student makes little or no effort.

TASK 3: Scoring Guide

$x = 90$ (Diagonals of a kite are $\perp$.)
$y = 5$ (Def. of isos. trapezoid)
$z = 75$ (Base angles of isos. trap. are $\cong$.)

3 Student gives correct answers and reasons.
2 Student gives mostly correct answers and reasons.
1 Student gives mostly incorrect answers and reasons.
0 Student makes little or no effort.

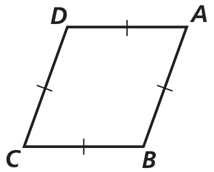
TASK 4: Scoring Guide

a. $Q = (5 - a, 5)$; $S = (5, 5 - a)$ **b.** Slope of $\overline{PR} = \frac{5 - 0}{5 - 0} = 1$. Slope of $\overline{QS} = \frac{5 - a - 5}{5 - (5 - a)} = -1$. Because the product of their slopes $= -1$, $\overline{PR} \perp \overline{QS}$.

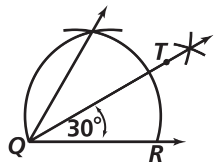
3 Student gives correct coordinates and a valid proof.
2 Student gives answers or a proof that contains minor errors.
1 Student gives incorrect coordinates in part a or a poorly constructed proof in part b.
0 Student makes little or no effort.

Cumulative Review

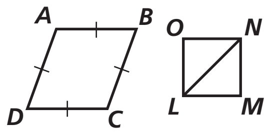
1. B **2.** J **3.** B **4.** H **5.** D **6.** J
7. A **8.** G **9.** B **10.** G **11.** B
12. J **13.** A **14.** 10 **15.** 38, 50, 92
16. Proof: $\overline{AB} \cong \overline{BC} \cong \overline{DC} \cong \overline{AD}$ by the definition of a rhombus. Also, $\overline{AC} \cong \overline{AC}$. Therefore, $\triangle ABC \cong \triangle CDA$ by the SSS Theorem.



17.



18.



19. Sample: The construction of the undercarriage of a bridge; it is a combination of triangles, which are the strongest geometric polygon.