Name ______________________________ Date ______________

LESSON 4.7

Practice A

For use with pages 276–282

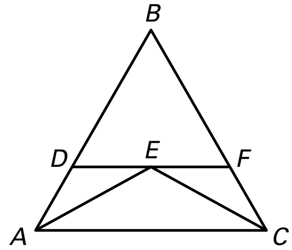
In Exercises 1–4, use the diagram. Copy and complete the statement. Tell what theorem or corollary you used.

1. If $\overline{AE} \cong \overline{CE}$, then $\angle$ __?__ $\cong \angle$ __?__.

2. If $\angle DAE \cong \angle DEA$, then __?__ $\cong$ __?__.

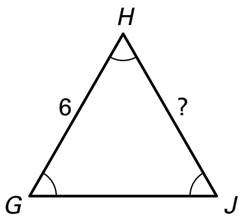
3. If $\angle BDF \cong \angle DBF \cong \angle BFD$, then __?__ $\cong$ __?__ $\cong$ __?__.

4. If $\overline{AB} \cong \overline{BC} \cong \overline{AC}$, then $\angle$ __?__ $\cong \angle$ __?__ $\cong \angle$ __?__.



Find the unknown measure.

5.



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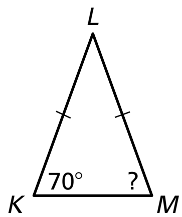

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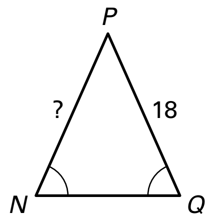
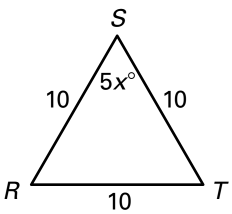


Find the value of *x*.

8.



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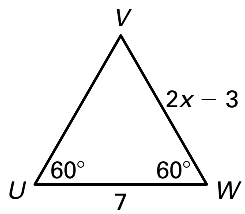

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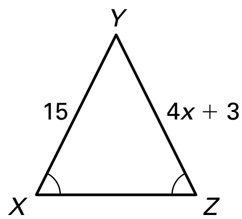

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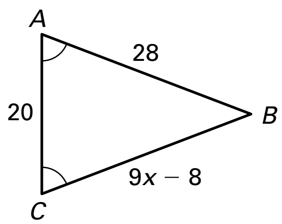

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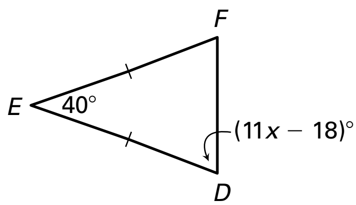

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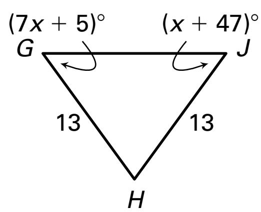
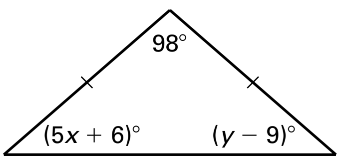


Find the values of *x* and *y*.

14.



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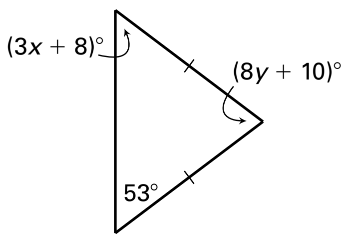

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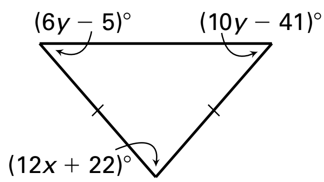


Name ____________________ Date ____________

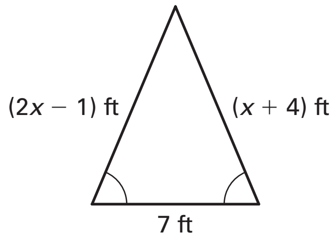
LESSON 4.7

Practice A *continued*

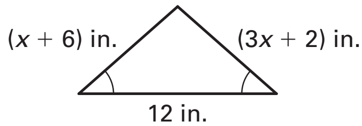
For use with pages 276–282

Find the perimeter of the triangle.

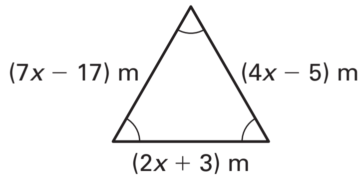
17.



18.



19.



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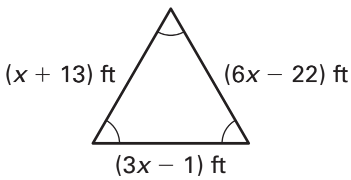

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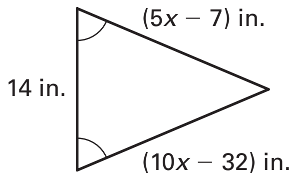

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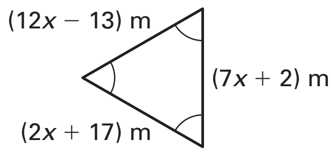
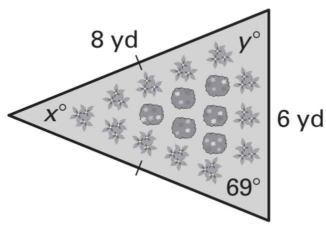


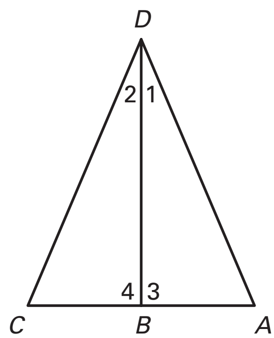
23. **Garden** You plant a garden in the shape of a triangle as shown in the figure. What is the perimeter of the garden? Find the values of x and y.



Complete the proof.

24. **GIVEN:** $\overline{BD}$ bisects $\angle ADC$.
$\overline{DB} \perp \overline{AC}$

PROVE: $\triangle ADC$ is isosceles.



Statements	Reasons
1. $\overline{BD}$ bisects $\angle ADC$.	**1.** ___?___
2. ___?___	**2.** Definition of Angle Bisector
3. ___?___	**3.** Given
4. $\angle 3$ and $\angle 4$ are right angles.	**4.** ___?___
5. $\angle 3 \cong \angle 4$	**5.** ___?___
6. $\overline{DB} \cong \overline{DB}$	**6.** ___?___
7. ___?___	**7.** ASA Congruence Postulate
8. ___?___	**8.** Corresponding parts of $\cong$ triangles are $\cong$.
9. $\triangle ADC$ is isosceles.	**9.** ___?___

Statements	Reasons
9. $m\angle CEB + m\angle CED = 180°$	9. Linear Pair Postulate
10. $m\angle CEB + m\angle CEB = 180°$	10. Substitution property of equality
11. $2m\angle CEB = 180°$	11. Simplify.
12. $m\angle CEB = 90°$	12. Division property of equality
13. $\angle CEB$ and $\angle CED$ are right angles.	13. Definition of right angle
14. $\overline{AC} \perp \overline{BD}$	14. Definition of perpendicular lines

6.

Statements	Reasons
1. $\overline{AB}$ and $\overline{CD}$ bisect each other at point M.	1. Given
2. M is the midpoint of $\overline{AB}$ and $\overline{CD}$.	2. Definition of segment bisector
3. $\overline{AM} \cong \overline{MB}$, $\overline{DM} \cong \overline{MC}$	3. Definition of midpoint
4. $\angle AMD \cong \angle BMC$	4. Vertical Angles Theorem
5. $\triangle AMD \cong \triangle BMC$	5. SAS Congruence Postulate
6. $\angle A \cong \angle B$	6. Corresp. parts of $\cong \triangle$ are $\cong$.
7. $\overline{AD} \parallel \overline{BC}$	7. Alternate Interior Angles Theorem

Lesson 4.7

Practice Level A

1. EAC, ECA; Base Angles Theorem

2. $\overline{DA}$, $\overline{DE}$; Converse of Base Angles Theorem

3. $\overline{DB}$, $\overline{BF}$, $\overline{FD}$; Corollary to the Converse of Base Angles Theorem **4.** BAC, ABC, BCA; Corollary to the Base Angles Theorem **5.** 6

6. 70° **7.** 18 **8.** 12 **9.** 5 **10.** 3 **11.** 4 **12.** 8

13. 7 **14.** $x = 7, y = 50$ **15.** $x = 15, y = 8$

16. $x = 5, y = 9$ **17.** 25 ft **18.** 28 in. **19.** 33 m

20. 60 ft **21.** 50 in. **22.** 69 m **23.** 22 yd; $x = 42, y = 69$ **24.** Given; $\angle 1 \cong \angle 2$; $\overline{DB} \perp \overline{AC}$; Perpendicular lines intersect to form right angles; Right Angle Congruence Theorem; Reflexive Property of Congruence; $\triangle DBA \cong \triangle DBC$; $\overline{DA} \cong \overline{DC}$; Definition of isosceles triangle

Practice Level B

1. $x = 22, y = 35$ **2.** $x = 15, y = 38$

3. $x = 29, y = 51$ **4.** $x = 10, y = 20$

5. $x = 32, y = 19$ **6.** $x = 30, y = 13$

7. You can prove the triangles are congruent by AAS Congruence Theorem. Use $\overline{BC} \cong \overline{BC}$ by the reflexive property of congruence. **8.** There is not enough information. You only know that corresponding angles in the two triangles are congruent, because two sets of lines are parallel. You do not know the lengths of any of the sides.

9. Given; $\angle G \cong \angle J$; Given; $\triangle FGH \cong \triangle FJI$; Corresponding parts of congruent triangles are congruent. **10.** Given; Given; Vertical Angles Theorem; $\triangle AEC \cong \triangle BED$; Corresponding parts of congruent triangles are congruent; Base Angles Theorem **11.** PQR, PTS; Base Angles Theorem

12. $\overline{PQ}$, $\overline{PV}$; Converse of Base Angles Theorem

13. PRS, PSR; Base Angles Theorem

14. PRT, RPT; Base Angles Theorem

15. $\overline{QS}$, $\overline{QP}$; Converse of Base Angles Theorem

16. $\overline{PU}$, $\overline{PV}$; Converse of Base Angles Theorem

17. 70° **18.** Each of the triangles is isosceles and every pair of adjacent triangles have a common side, so the legs of all the triangles are congruent by the Transitive Property of Congruence. The common vertex angles are congruent, so any two of the triangles are congruent by the SAS Congruence Postulate. **19.** equilateral

Practice Level C

1. $x = 9, y = 11$ **2.** $x = 6, y = 13$ **3.** $x = 3.5, y = 9$ **4.** $x = 12, y = 5$ **5.** $x = 6, y = 7$

6. $x = 3, y = 9.5$ **7.** $x = 20.5, y = 6$ **8.** $x = 8, y = 3$ **9.** cannot determine x or y; could find y if it was given that $9y - 10$ is equal to $5y - 8$.

10. 98 in. **11.** 72.5 m **12.** 149.25 ft

13. $x = 64.5, y = 25.5, z = 129$ **14.** $x = 58, y = 32, z = 32$ **15.** $x = 68, y = 40, z = 36$

16. Given; $\overline{BA} \cong \overline{BC}$; Reflexive Property of Congruence; $\overline{BD} \cong \overline{BE}$; $\triangle BDC \cong \triangle BEA$; Corresponding parts of $\cong$ triangles are $\cong$.
17. $\angle 1 \cong \angle 2$; Converse of Base Angles Theorem; $NL = NK$; $\overline{JN} \cong \overline{MN}$; Definition of $\cong$ segments; $JN + NL = MN + NK$; Segment Addition Postulate; $JL = MK$; Definition of $\cong$ segments; $\overline{KL} \cong \overline{KL}$; SAS Congruence Postulate; Corresponding parts of $\cong$ triangles are $\cong$.

Review for Mastery

1. 6 **2.** 60° **3.** $x = 75$; $y = 21$ **4.** From part (b) you know that $\triangle ACD$ is equiangular. By the Corollary to the Converse of Base Angles Theorem, $\triangle ACD$ is equilateral, and $\overline{AD} \cong \overline{AC}$.