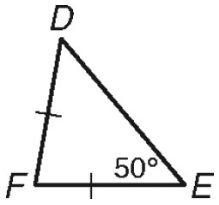
LESSON 7-2

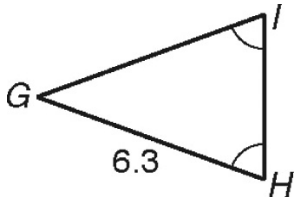
# Isosceles and Equilateral Triangles

## *Practice and Problem Solving: A/B*

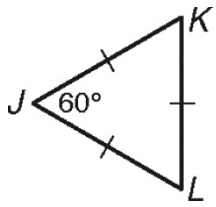
**For Problems 1–6, find each value.**

1. 

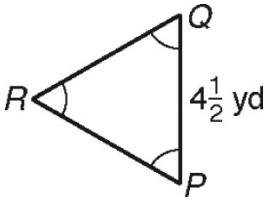

m∠*D* = _____°

2. 

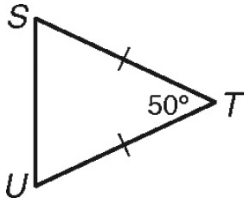

*GI* = _____

3. 

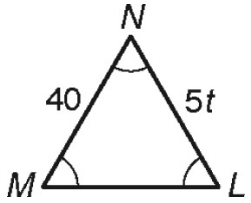

m∠*L* = _____°

4. 


*RQ* = _____

5. 


m∠*U* = _____°

6. 

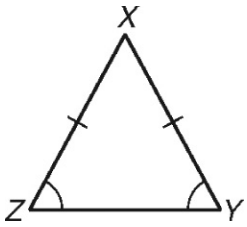

*t* = _____

**Use principles of isosceles and equilateral triangles to answer Problems 7–9.**

7. Point *M* lies on side *JL* of triangle *JKL*. $\overline{KM}$ bisects $\overline{JL}$ and forms equilateral triangle *KLM*.

   What is the measure of ∠*J*? _____° Make a sketch and explain your answer.

**Name the parts of the figure. The first one is done for you.**



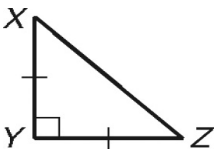

10. base: $\overline{ZY}$

11. legs: _____ and _____

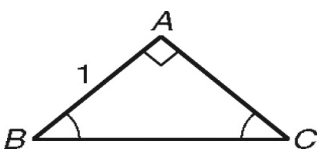
12. base angles: _____ and _____

13. vertex angle: _____

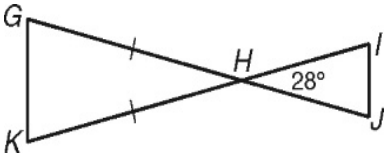
**Find each value. The first one is done for you.**

14. 


m∠*X* = _____°

15. 

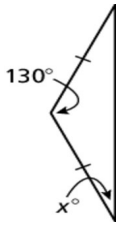

*AC* = _____

16. 

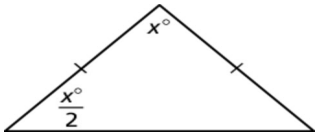

m∠*K* = _____°

In Exercises 17-19, find the value of *x*.

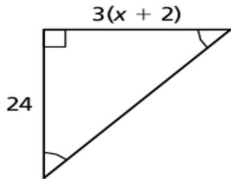
**17.**




**18.**




**19.**



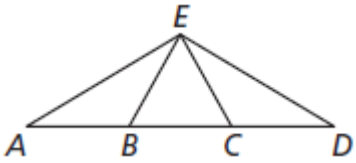

**In Exercises 20 – 23, copy and complete the statement. Give reasons for each.**

20. If $\overline{AE} \cong \overline{DE}$, then $\angle$____ $\cong$ $\angle$___.

21. If $\overline{AB} \cong \overline{EB}$, then $\angle$___ $\cong$ $\angle$____.

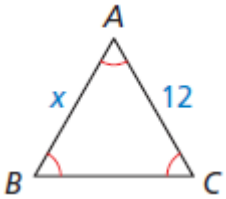
22. If $\angle D \cong \angle CED$, then___$\cong$____.

23. If $\angle EBC \cong \angle ECB$, then___$\cong$____.

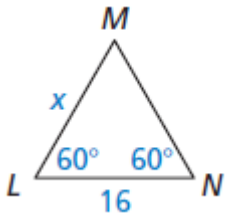



**In Exercises 24 – 27, find the value of *x*.**

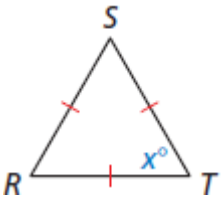
24.



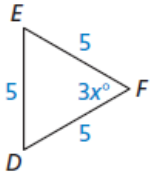

25.




26.



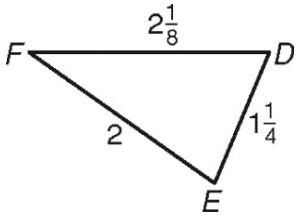

27.



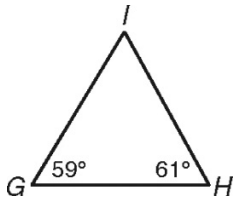

**For Problems 1–3, name the angles or sides.**

1. Write the angles of $\triangle DEF$ in order from smallest to largest.

$\angle$_____ $\angle$_____ $\angle$_____



2. Write the sides of $\triangle GHI$ in order from shortest to longest.




_____ _____ _____

3. The sides of triangle *XYZ* are given in order below from longest to shortest. Name the angles from largest to smallest.

$\overline{XZ}$ $\overline{ZY}$ $\overline{YX}$

$\angle$ _____ $\angle$ _____ $\angle$ _____

**Use your knowledge of triangle inequalities to solve Problems 4–5.**

4. Can three segments with lengths 8, 15, and 6 make a triangle? Explain your answer.

5. Aaron, Brandon, and Clara sit in class so that they are at the vertices of a triangle. It is 15 feet from Aaron to Brandon, and it is 8 feet from Brandon to Clara. Give the range of possible distances, *d*, from Aaron to Clara.

**For Problems 6-8, choose the correct words to complete the statements. The first one is done for you.**

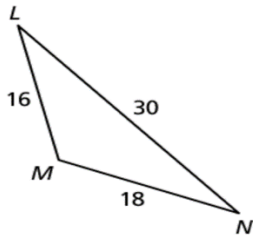
6. The longest side of a triangle is opposite the **largest** (largest/smallest) angle.

7. The sum of any two side lengths of a triangle is _____ (less than/greater than) the third side length.

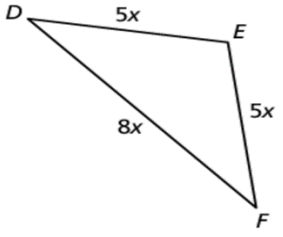
8 The smallest angle of a triangle is _____ (next to/opposite) the shortest side.

**In Exercises 9 and 10, list the angles of the given triangle from smallest to largest.**

**9.**

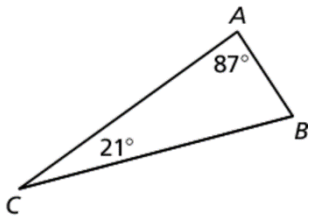



**10.**

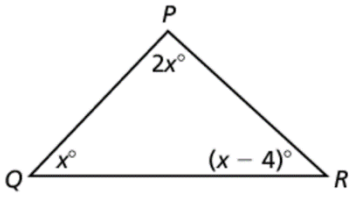


**In Exercises 11-14, list the sides of the given triangle from shortest to longest.**

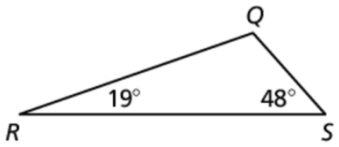
**11.**



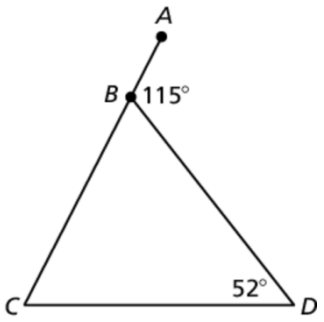

**12.**




**13.**




**14.**




**In Exercises 15 - 20, is it possible to construct a triangle with the given side lengths? Explain.**

**15.** 15, 37, 53

**16.** 9, 16, 8

**17.** 6, 7, 11

**18.** 3, 6, 9

**19.** 28, 17, 46

**20.** 35, 120, 125

21. Is it possible to construct a triangle with side lengths $5(2x - 6)$, $3x + 80$, and $x^2 + 41$ if $x = 9$? Explain.

22. In $\triangle DEF$, $m\angle D = (x + 25)°$, $m\angle E = (2x - 4)°$, and $m\angle F = 63°$. List the side lengths and angle measures of the triangle in order from least to greatest.

**In Exercises 23 – 26, describe the possible lengths of the third side of the triangle given the lengths of the other two sides.**

**23.** 5 inches, 12 inches

**24.** 12 feet, 18 feet

**25.** 2 feet, 40 inches

**26.** 25 meters, 25 meters