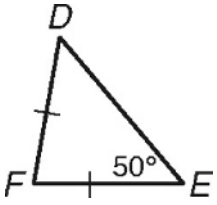
Name _____ Date _____ Class _____

LESSON 7-2

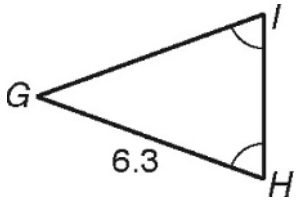
Isosceles and Equilateral Triangles

Practice and Problem Solving: A/B

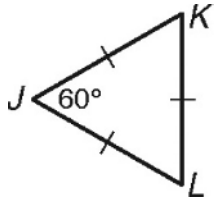
For Problems 1–6, find each value.

1. 

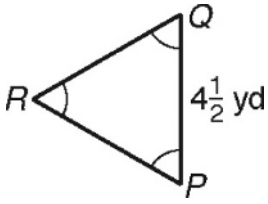
m∠*D* = _____°

2. 

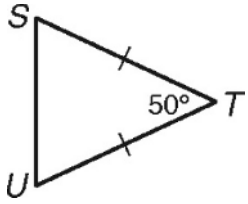
GI = _____

3. 

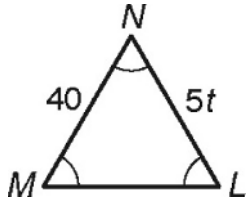
m∠*L* = _____°

4. 

RQ = _____

5. 

m∠*U* = _____°

6. 

t = _____

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

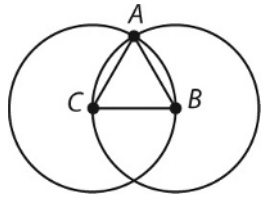
7. Point *M* lies on side *JL* of triangle *JKL*. $\overline{KM}$ bisects $\overline{JL}$ and forms equilateral triangle *KLM*. What is the measure of ∠*J*? _____°

   Make a sketch and explain your answer. _____

   _____

   _____

8. Circle *B* and circle *C* are congruent. Point *A* is an intersection of the two circles. Write a paragraph proof to show that △*ABC* is equilateral.



   _____

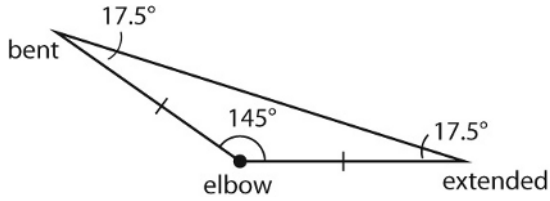
   _____

   _____

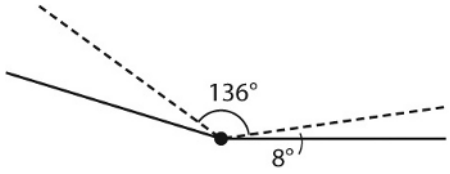
   _____

9. The Washington Monument is an *obelisk,* a tall, thin, four-sided monument that tapers to a pyramidal top. Each face of the pyramidal top of the Washington Monument is an isosceles triangle. The height of each triangle is 55.5 feet, and the base of each triangle measures 34.4 feet. Find the length, to the nearest tenth of a foot, of one of the two congruent legs of the triangle. _____ ft

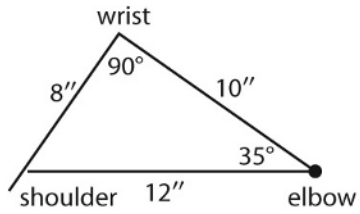
5. 145°, 17.5°, 17.5°



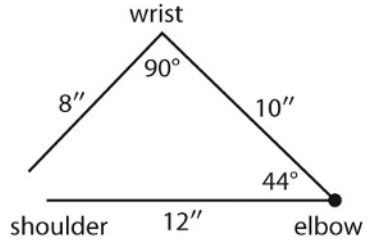
6. 17°



7. With these measurements, a person's fingers are more than long enough to touch the shoulder.



8. Ella cannot bend her elbow and wrist enough to touch her shoulder.



Practice and Problem Solving: Modified

1. 90°
2. 180°
3. 180°
4. 155°
5. interior
6. 155°
7. 90°
8. complementary
9. 32°
10. 113°

Reading Strategies

1. 53°
2. 60°; 360°
3. 150°, 360°
4. 40°
5. 80°
6. 120°
7. 48°

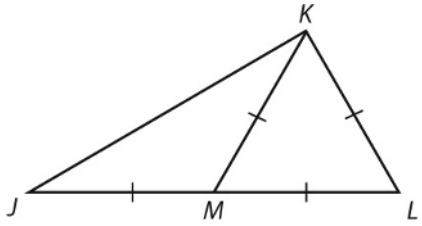
Success for English Learners

1. Interior angles: $\angle 1$, $\angle 2$, $\angle 3$
   Exterior angle: $\angle 4$
   Remote interior angles: $\angle 1$, $\angle 2$
   $m\angle 1 + m\angle 2 + m\angle 3 = 180°$
   $m\angle 4 + m\angle 3 = 180°$
   $m\angle 4 = m\angle 1 + m\angle 2$
2. $m\angle 1 + m\angle 2 + m\angle 3 = 180°$:
   The sum of the interior angles is 180°.
   $m\angle 1 + m\angle 2 + m\angle 3 = 180°$:
   The sum of an exterior angle and the interior angle next to it is 180°.
   $m\angle 4 = m\angle 1 + m\angle 2$:
   The measure of an exterior angle is the sum of its two remote interior angles.

LESSON 7-2

Practice and Problem Solving: A/B

1. 50°
2. 6.3
3. 60°
4. $4\frac{1}{2}$ yd
5. 65°
6. 8
7.



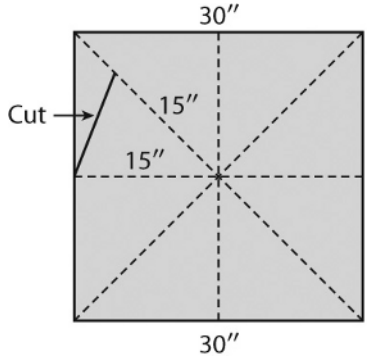
30°. $\overline{KL}$, $\overline{LM}$, and $\overline{MK}$ are congruent because they are the sides of an equilateral triangle. $\overline{MJ}$ is also congruent to those three sides because M is the midpoint of $\overline{JL}$. Angle KML is 60° because

it is in an equilateral triangle. Angles J and MKJ have the same measure because they are opposite congruent sides in an isosceles triangle. Their sum is 60°, so each one is 30°.

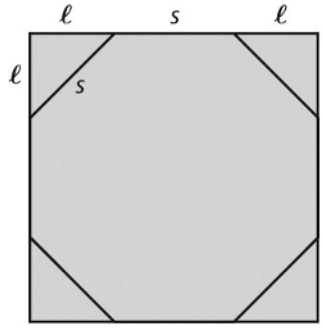
8. It is given that circles B and C are congruent. $\overline{AB}$ is a radius of circle B, $\overline{AC}$ is a radius of circle C, and $\overline{BC}$ is a radius of both circles. All three segments are congruent because the radii of congruent circles are congruent. Therefore $\triangle ABC$ is equilateral by definition because all three of its sides are congruent.
9. 58.1 ft

Practice and Problem Solving: C

1. 600 ft
2. 33.75 in.
3. $x = 36$; $y = 72$; $z = 36$
4. 45°, 67.5°, 67.5°



5. 11.5 in.
6. To make eight sides and keep the maximum width, cut one isosceles triangle off each corner of the square. The length of each side of the octagon (s) must equal the length of the base of the triangle that is cut off.



$2l^2 = s^2$

$2l^2 + s = 30$

$s = 30 - 2l$

$2l^2 = (30 - 2l)^2 = 900 - 120l + 4l^2$

$l \approx 8.8$ in.

$s \approx 12.4$ in.

Practice and Problem Solving: Modified

1. $\overline{ZY}$
2. $\overline{XZ}$ and $\overline{XY}$
3. $\angle Z$ and $\angle Y$
4. $\angle X$
5. 45
6. 1
7. 76
8. 12
9. 45
10. 10
11.

Statements	Reasons
1. $\triangle ABC$ is isosceles $\overline{BD} \cong \overline{CD}$.	1. Given
2. $\overline{AB} \cong \overline{AC}$	2. Property of isosceles triangle
3. $\overline{AD} \cong \overline{AD}$	3. Reflexive property
4. $\triangle ADB \cong \triangle ADC$	4. SSS
5. $\angle ADB \cong \angle ADC = 90°$	5. CPCTC
6. $\overline{AD} \perp \overline{BC}$	6. Definition of perpendicular

Reading Strategies

1. Example: If two sides of a triangle are congruent" (point to $\overline{XZ}$ and $\overline{XY}$), "then the angles opposite those sides are congruent" (point to $\angle Y$ opposite $\overline{XZ}$, and $\angle Z$ opposite $\overline{XY}$).