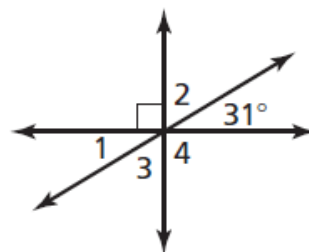


Find the measurement.

1.  $m\angle 1$

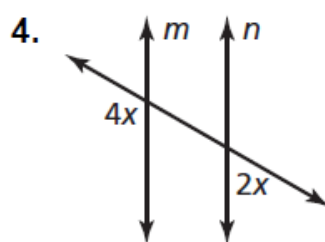
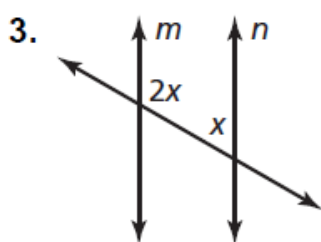
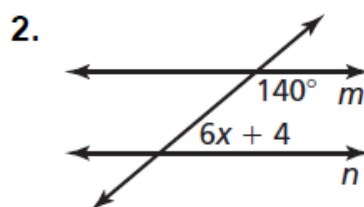
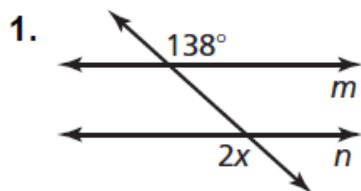
2.  $m\angle 2$



3.  $m\angle 3$

4.  $m\angle 4$

Find the value of  $x$  that makes  $m \parallel n$ .

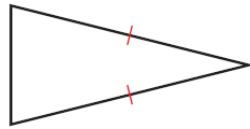


## **Essential Question**

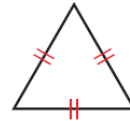
How are the angle measures of a triangle related?

 **Core Concept****Classifying Triangles by Sides****Scalene Triangle**

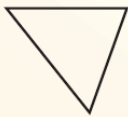
no congruent sides

**Isosceles Triangle**

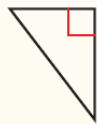
at least 2 congruent sides

**Equilateral Triangle**

3 congruent sides

**Classifying Triangles by Angles****Acute Triangle**

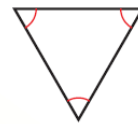
3 acute angles

**Right Triangle**

1 right angle

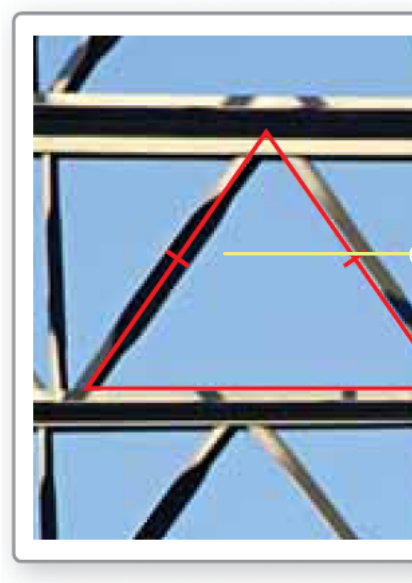
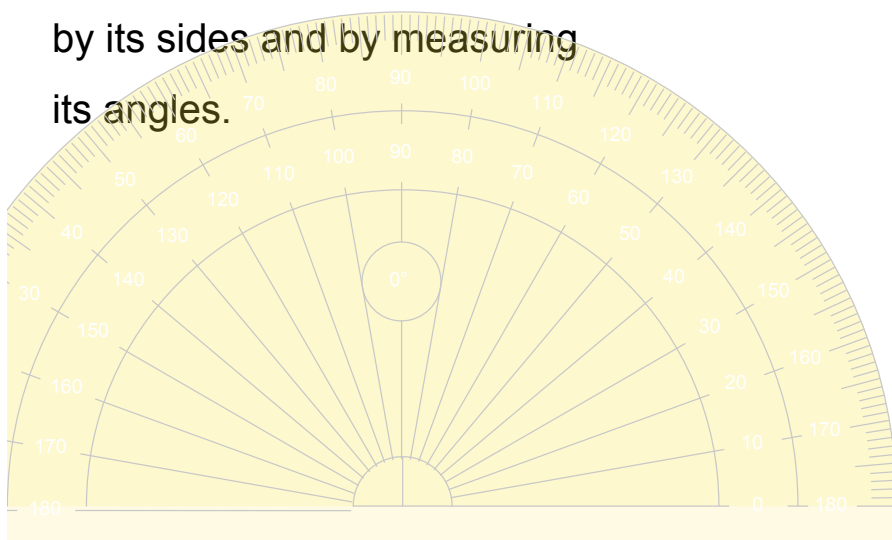
**Obtuse Triangle**

1 obtuse angle

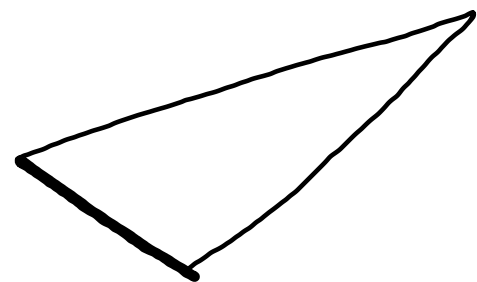
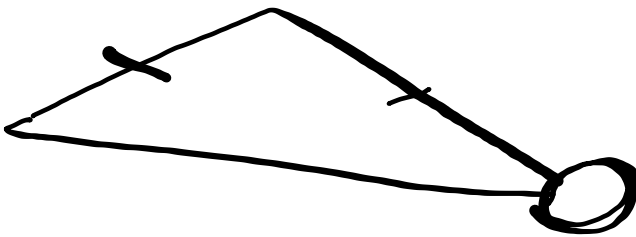
**Equiangular Triangle**

3 congruent angles

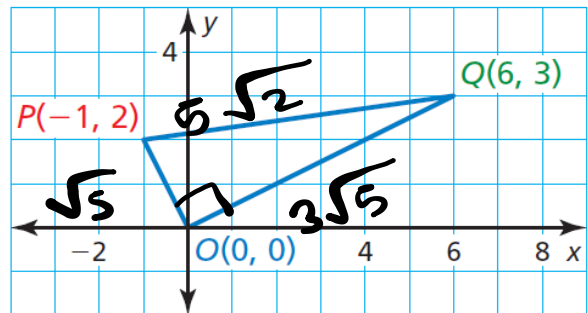
Classify the triangular shape of the support beams in the diagram by its sides and by measuring its angles.



1. Draw an obtuse isosceles triangle and an acute scalene triangle.



Classify  $\triangle OPQ$  by its sides.  
Then determine whether it is  
a right triangle.



$$PO : \sqrt{(-1)^2 + (2)^2}$$

$$QP : \sqrt{(6 - (-1))^2 + (3 - 2)^2} = \sqrt{50} = 5\sqrt{2}$$

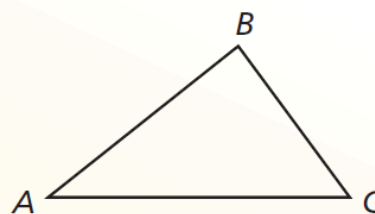
$$QO : \sqrt{6^2 + 3^2} = \sqrt{45} = 3\sqrt{5}$$

## Theorem

### ~~Theorem 51~~ Triangle Sum Theorem

The sum of the measures of the interior angles of a triangle is  $180^\circ$ .

*Proof* p. 234; Ex. 53, p. 238



$$m\angle A + m\angle B + m\angle C = 180^\circ$$

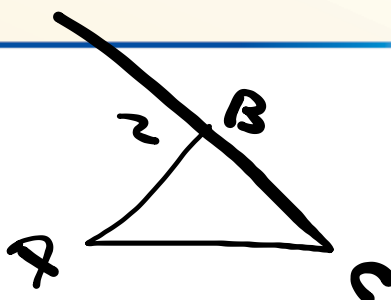
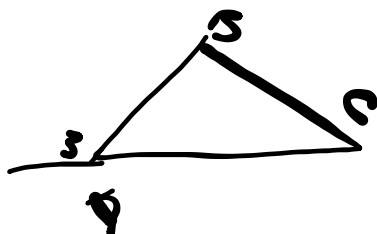
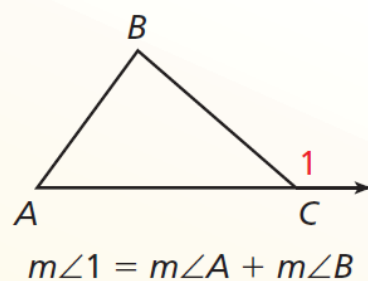


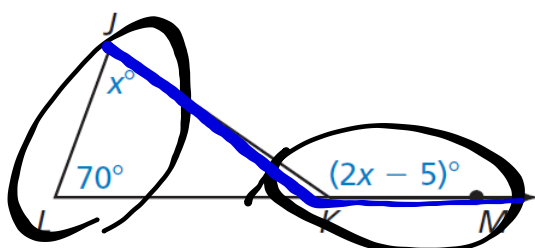
## Theorem

### Theorem 1.2 Exterior Angle Theorem

The measure of an exterior angle of a triangle is equal to the sum of the measures of the two nonadjacent interior angles.

*Proof* Ex. 42, p. 237



Find  $m\angle JKM$ .

$$70 + x = 2x - 5$$

$$-x \quad -x$$

$$70 = x - 5$$

$$+5 \quad +5$$

$$x = 75$$

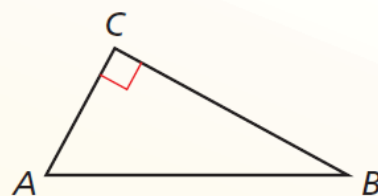
$$m\angle JKM = 2x - 5$$

$$2(75) - 5 = 145^\circ$$

## Corollary

### **Corollary 5.1** Corollary to the Triangle Sum Theorem

The acute angles of a right triangle are complementary.

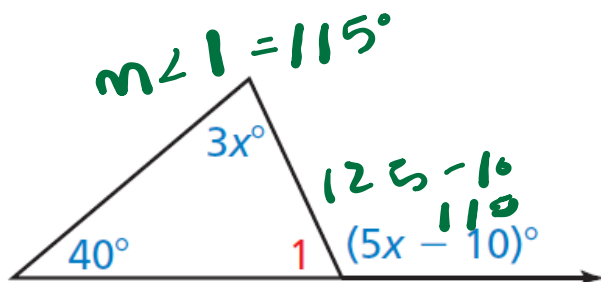


$$m\angle A + m\angle B = 90^\circ$$

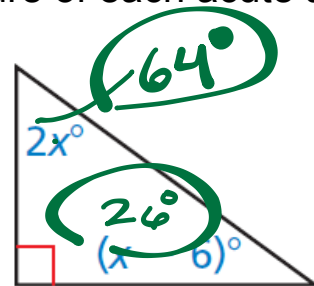
*Proof* Ex. 41, p. 237

3. Find the measure of  $\angle 1$ .

4. Find the measure of each acute angle.



$$\begin{array}{r}
 3x + 40 = 5x - 10 \\
 -3x + 10 \quad -3x + 10 \\
 \hline
 50 = 2x \quad x = 25 \\
 \frac{50}{2} = \frac{2x}{2}
 \end{array}$$



$$2x + (x - 6) = 90$$

$$\begin{array}{r}
 3x - 6 = 90 \\
 +6 \quad +6 \\
 \hline
 3x = 96
 \end{array}$$

$$\frac{3x}{3} = \frac{96}{3}$$

$$x = 32$$

- Response Logs: “I figured out that ...”, or “What is confusing me the most is ....”

