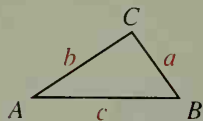
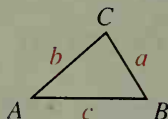
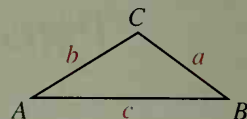


Theorem 8-3

If $c^2 = a^2 + b^2$,
then $m\angle C = 90^\circ$,
and $\triangle ABC$ is right.

Theorem 8-4

If $c^2 < a^2 + b^2$,
then $m\angle C < 90^\circ$,
and $\triangle ABC$ is acute.

Theorem 8-5

If $c^2 > a^2 + b^2$,
then $m\angle C > 90^\circ$,
and $\triangle ABC$ is obtuse.

Example A triangle has sides of the given lengths. Is it acute, right, or obtuse?

a. 9, 40, 41

b. 6, 7, 8

c. 7, 8, 11

Solution a. $41^2 \stackrel{?}{=} 9^2 + 40^2$
 $1681 \stackrel{?}{=} 81 + 1600$
 $1681 = 1681$

The triangle is right.

b. $8^2 \stackrel{?}{=} 6^2 + 7^2$
 $64 \stackrel{?}{=} 36 + 49$
 $64 < 85$

The triangle is acute.

c. $11^2 \stackrel{?}{=} 7^2 + 8^2$
 $121 \stackrel{?}{=} 49 + 64$
 $121 > 113$

The triangle is obtuse.

Classroom Exercises

If a triangle is formed with sides having the lengths given, is it acute, right, or obtuse? If a triangle can't be formed, say *not possible*.

1. 6, 8, 10

2. 4, 6, 8

3. 1, 4, 6

4. 8, 10, 12

5. $\sqrt{7}, \sqrt{7}, \sqrt{14}$

6. 4, $4\sqrt{3}$, 8

7. Specify all values of x that make the statement true.

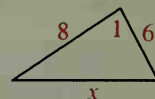
a. $\angle 1$ is a right angle.

b. $\angle 1$ is an acute angle.

c. $\angle 1$ is an obtuse angle.

d. The triangle is isosceles.

e. No triangle is possible.

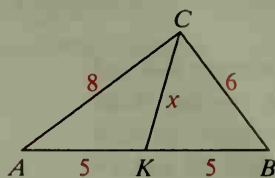


Exercises 8–10 refer to the figures below.

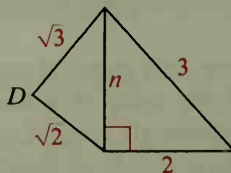
8. Explain why x must equal 5.

9. Explain why $\angle D$ must be a right angle.

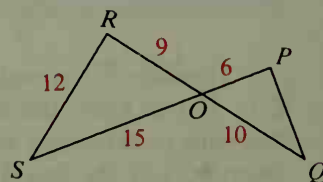
10. Explain why $\angle P$ must be a right angle.



Ex. 8



Ex. 9



Ex. 10