Triangles can be classified in two ways – by their angles or by their sides. All triangles have at least two acute angles, but the third angle is used to classify the triangle.

Before we start to classify triangles by **angles**, we need to look different classifications for angles.
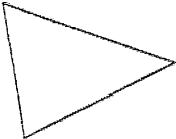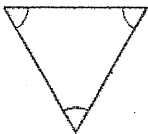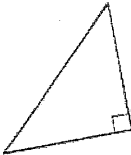Right angle: an angle whose measure is _____.
Obtuse angle: an angle whose measure is between _____ and _____.
Acute angle: an angle whose measure is between _____ and _____.

1.   A right triangle is a triangle with one _____ angle.

2.   An obtuse triangle is a triangle with one _____ angle.

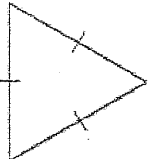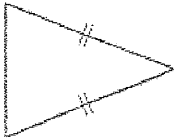3.   An acute triangle is a triangle with three _____ angles.

When classifying triangles, be as specific as possible. While a triangle with three congruent acute angles is an acute triangle, it is more specific to classify it an equiangular triangle.

KeyConcept Classifications of Triangles by Angles

acute triangle	equiangular triangle	obtuse triangle	right triangle
3 acute angles	3 congruent acute angles	1 obtuse angle	1 right angle

An equiangular triangle is a special kind of acute triangle.

There are also ways to classify triangles by **sides**.

4.   A scalene triangle is a triangle with 3 _____ side lengths.

5.   An isosceles triangle is a triangle with at least _____ congruent sides.

6.   An equilateral triangle is a triangle with exactly _____ congruent sides.
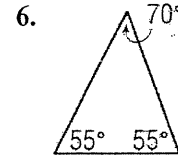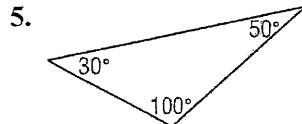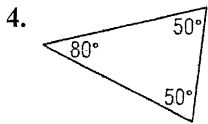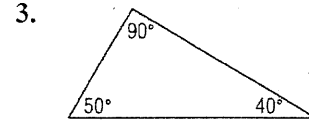

KeyConcept Classifications of Triangles by Sides

equilateral triangle	isosceles triangle	scalene triangle
3 congruent sides	at least 2 congruent sides	no congruent sides

An equilateral triangle is a special kind of isosceles triangle.

4-1 Skills Practice
Classifying Triangles

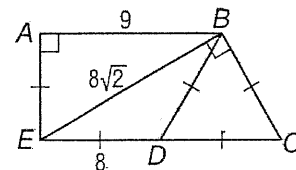Classify each triangle as *acute, equiangular, obtuse,* or *right.*

1.

60°
60°   60°

2.   40°

95°   45°

3.   90°

50°   40°

4.   50°
80°
50°

5.   50°
30°
100°

6.   70°

55°   55°

Classify each triangle as *equilateral, isosceles,* or *scalene.*

7. △*ABE*

8. △*EDB*

9. △*EBC*

10. △*DBC*

A   9   B
8√2
E   C
8   D

11. ALGEBRA Find *x* and the length of each side if △*ABC* is an isosceles triangle with $\overline{AB} \cong \overline{BC}$.

B
4x − 3   2x + 5
A   x + 2   C

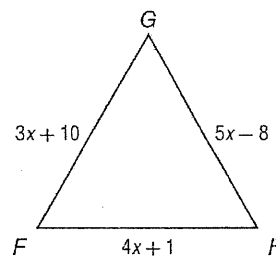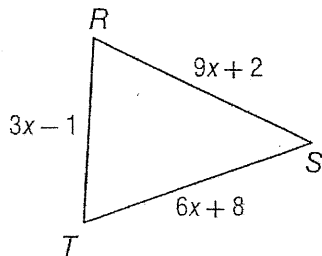**12. ALGEBRA** Find *x* and the length of each side if △*FGH* is an equilateral triangle.

G
3x + 10   5x − 8
F   4x + 1   H

13. ALGEBRA Find *x* and the length of each side if △*RST* is an isosceles triangle with $\overline{RS} \cong \overline{TS}$.

R
9x + 2
3x − 1
S
6x + 8
T

14. ALGEBRA Find *x* and the length of each side if △*DEF* is an equilateral triangle.

E
2x + 6   5x − 21
D   7x − 39   F
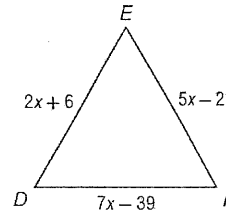
Triangles can be classified in two ways – by their angles or by their sides. All triangles have at least two acute angles, but the third angle is used to classify the triangle.

Before we start to classify triangles by **angles**, we need to look different classifications for angles.
Right angle: an angle whose measure is ___$90°$___.
Obtuse angle: an angle whose measure is between ___$90°$___ and ___$180°$___.
Acute angle: an angle whose measure is between ___0___ and ___$90°$___.

1.   A right triangle is a triangle with one ____right____ angle.

2.   An obtuse triangle is a triangle with one ____obtuse____ angle.

3.   An acute triangle is a triangle with three ____acute____ angles.

When classifying triangles, be as specific as possible. While a triangle with three congruent acute angles is an acute triangle, it is more specific to classify it an equiangular triangle.

KeyConcept Classifications of Triangles by Angles

acute triangle	equiangular triangle	obtuse triangle	right triangle
3 acute angles	3 congruent acute angles	1 obtuse angle	1 right angle

An equiangular triangle is a special kind of acute triangle.

There are also ways to classify triangles by **sides**.
4.   A scalene triangle is a triangle with 3 ____unequal____ side lengths.

5.   An isosceles triangle is a triangle with at least ____2____ congruent sides.

6.   An equilateral triangle is a triangle with exactly ____3____ congruent sides.
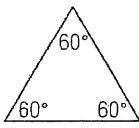
KeyConcept Classifications of Triangles by Sides

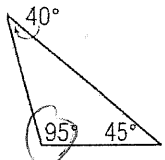| equilateral triangle	isosceles triangle	scalene triangle
3 congruent sides	at least 2 congruent sides	no congruent sides

An equilateral triangle is a special kind of isosceles triangle.

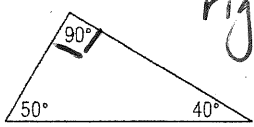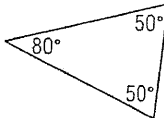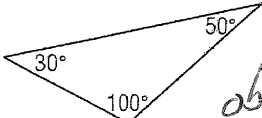# 4-1 Skills Practice
Classifying Triangles

Classify each triangle as *acute*, *equiangular*, *obtuse*, or *right*.
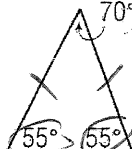
1. *acute*
    equiangular
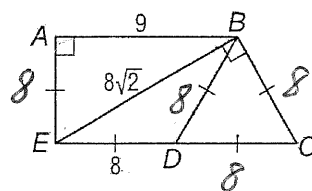
2. *obtuse*

3. *right*

4. *acute*

5. *obtuse*

6. *acute*
    (isosceles)

Classify each triangle as *equilateral*, *isosceles*, or *scalene*.
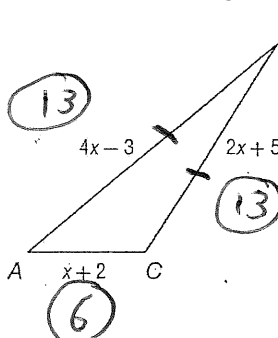
7. △ABE   *Scalene*
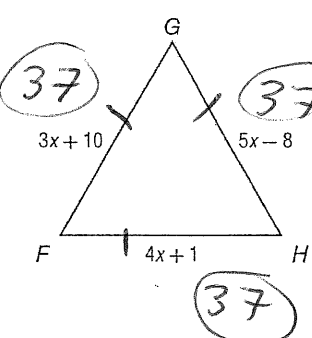
8. △EDB   *isosceles*

9. △EBC   *Scalene*

10. △DBC   *equilateral*

11. **ALGEBRA** Find x and the length of each side if △ABC is an isosceles triangle with $\overline{AB} \cong \overline{BC}$.

$2x + 5 = 4x - 3$
$-2x \quad -2x + 3$
$\underline{\qquad\qquad}$
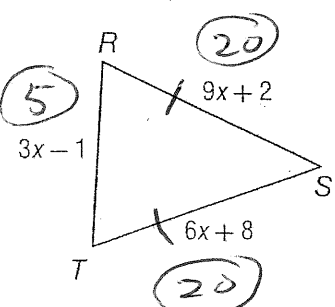$8 = 2x$
$x = 4$

⑬   ⑬   ⑥

12. **ALGEBRA** Find x and the length of each side if △FGH is an equilateral triangle.

$3x + 10 = 4x + 1$
$9 = x$

㊲   ㊲   ㊲

13. **ALGEBRA** Find x and the length of each side if △RST is an isosceles triangle with $\overline{RS} \cong \overline{TS}$.
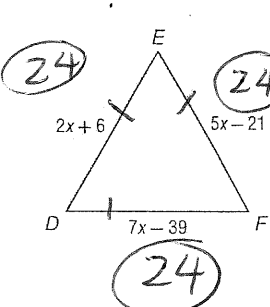
$9x + 2 = 6x + 8$
$3x = 6$
$x = 2$

⑳   ⑤   ⑳

14. **ALGEBRA** Find x and the length of each side if △DEF is an equilateral triangle.

$7x - 39 = 2x + 6$
$5x = 45$
$x = 9$

㉔   ㉔   ㉔