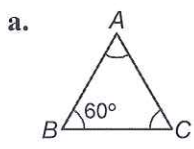## 4-1 Study Guide and Intervention

Classifying Triangles

Classify Triangles by Angles One way to classify a triangle is by the measures of its angles.

| |
|---|
| • If *all three* of the angles of a triangle are acute angles, then the triangle is an **acute triangle**. |
| • If *all three* angles of an acute triangle are congruent, then the triangle is an **equiangular triangle**. |
| • If *one* of the angles of a triangle is an obtuse angle, then the triangle is an **obtuse triangle**. |
| • If *one* of the angles of a triangle is a right angle, then the triangle is a **right triangle**. |

Example Classify each triangle.

a.

All three angles are congruent, so all three angles have measure 60°.
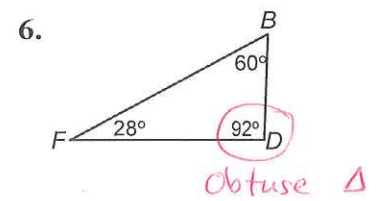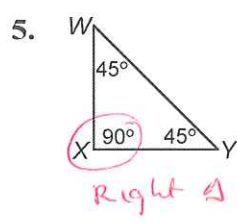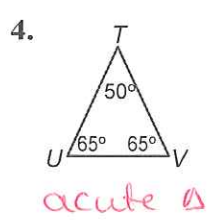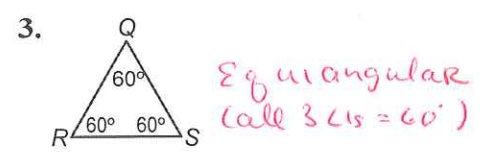The triangle is an equiangular triangle.
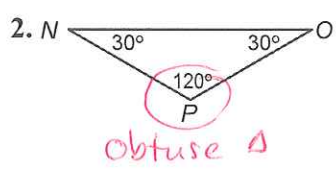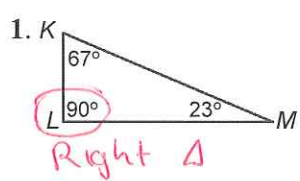
b.
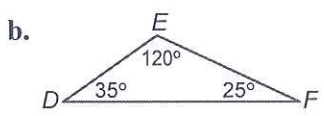
The triangle has one angle that is obtuse. It is an obtuse triangle.

c.
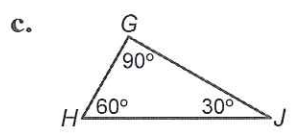
The triangle has one right angle. It is a right triangle.

Exercises

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

1.

Right △

2.

Obtuse △

3.

Equiangular
(all 3 ∠s = 60°)

4.

acute △

5.

Right △

6.

Obtuse △

# 4-1 Study Guide and Intervention *(continued)*

Classifying Triangles

Classify Triangles by Sides You can classify a triangle by the number of congruent sides. Equal numbers of hash marks indicate congruent sides.

| |
|---|
| • If *all three* sides of a triangle are congruent, then the triangle is an **equilateral triangle**. |
| • If *at least two* sides of a triangle are congruent, then the triangle is an **isosceles triangle**. Equilateral triangles can also be considered isosceles. |
| • If *no two* sides of a triangle are congruent, then the triangle is a **scalene triangle**. |

Example Classify each triangle.

a.
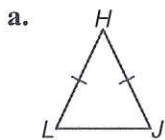
H, L, J triangle

Two sides are congruent. The triangle is an isosceles triangle.

b.
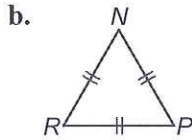
N, R, P triangle

All three sides are congruent. The triangle is an equilateral triangle.

c.

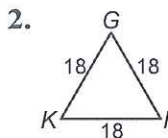T, X, V triangle with 23, 12, 15
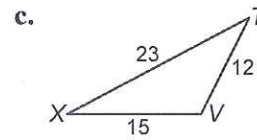
The triangle has no pair of congruent sides. It is a scalene triangle.

Exercises

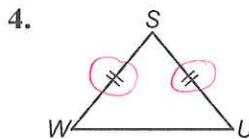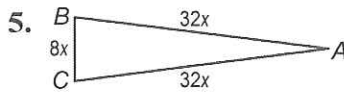Classify each triangle as *equilateral, isosceles,* or *scalene.*
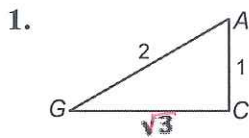
1.

Triangle A, G, C with 2, 1, √3

no sides ≅ scalene

2.

Triangle G, K, I with 18, 18, 18

All sides ≅ equilateral

3.

Triangle M, Q, O with 12, 17, 19

scalene

4.

Triangle S, W, U

Isosceles: 2 sides ≅

5.

Triangle B, C, A with 8x, 32x, 32x

Isosceles: 2 sides ≅

6.

Triangle D, E, F with x, x, x
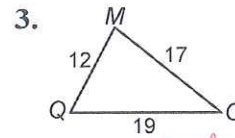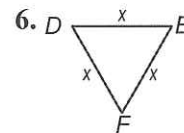
ALL sides ≅ equilateral

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

Triangle R, S, T with $2x+2$, $5x-4$, $3x$

*all sides ≅
set any
2 sides ≅*
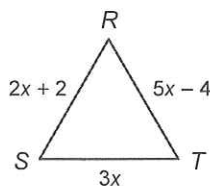
$RT = 5(2)-4$
$= 6$
$ST = 3(2) = 6$
$RS = 2(2)+2 = 6$

$3x = 2x+2$
$-2x \quad -2x$
$x = 2$

8. ALGEBRA Find x and the length of each side if △ *ABC* is isosceles with $AB = BC$.

Triangle A, B, C with $4y$, $3y+2$, $3y$
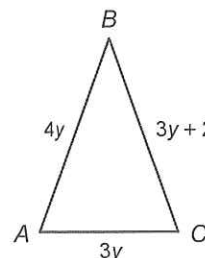
$AB = BC$
$4y = 3y+2$
$-3y \quad -3y$
$y = 2$

$AB = 4(2) = 8$
$BC = 3(2)+2 = 8$
$AC = 3(2) = 6$