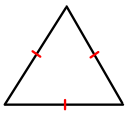
Triangles
(part 3)

title

Classifying Triangles

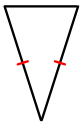
Classifying by **SIDES**

Equilateral Triangle



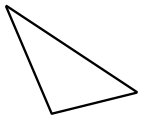
3 congruent sides

Isosceles Triangle



at least 2 congruent sides

Scalene Triangle



no congruent sides

classifying triangles

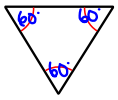
Classifying Triangles

Classifying by **ANGLES**

Acute Triangle

3 acute angles

Equiangular Triangle

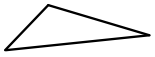


3 congruent angles

Right Triangle

1 right angle

Obtuse Triangle



1 obtuse angle

classifying triangles

How to classify triangles by their angle measures using the side lengths:

Converse of the Pythagorean Theorem

Let a, b, and c be the side lengths of a triangle, and c is the longest side length.

Acute Δ: $c^2 < a^2 + b^2$

Right Δ: $c^2 = a^2 + b^2$

Obtuse Δ: $c^2 > a^2 + b^2$

classifying triangles

Is it possible to construct a triangle with the given side lengths? If you can form a triangle with the given side lengths, classify the triangle as *acute*, *right*, or *obtuse*.

9, 11, 15 (c)

$9+11>15$

yes

15^2 9^2+11^2

225 $81+121$

$225 > 202$ Obtuse

7, 8, 10 (c)

$7+8>10$

yes

10^2 7^2+8^2

100 $49+64$

$100 < 113$ Acute

examples

Is it possible to construct a triangle with the given side lengths? If you can form a triangle with the given side lengths, classify the triangle as *acute*, *right*, or *obtuse*.

3, 6, $\sqrt{89}$

$3+6 > \sqrt{89}$

$9 > 9.43$ Not $\triangle$

5, $2\sqrt{14}$, 9 (c)

$2\sqrt{14} \approx 7.48$

$5+7.48>9$

yes

9^2 $5^2+(2\sqrt{14})^2$

81 $25+56$

$81 = 81$ Rt $\triangle$

examples

A triangle has the given vertices. Graph the triangle and classify it by its sides and angles.

A(-4, -2), *B*(1, 4), and *C*(5, -3)

$AB = \sqrt{(-4-1)^2+(-2-4)^2}$

$= \sqrt{25+36}$

$= \sqrt{61}$

$BC = \sqrt{65}$

$AC = \sqrt{82}$

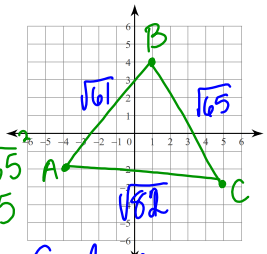
$\sqrt{82}^2$ $\sqrt{61}^2+\sqrt{65}$

82 $61+65$

$82 < 126$

Scalene

Acute



examples

Conclusion

1. How can you tell if a triangle is acute? $c^2 < a^2+b^2$
2. How can you tell if a triangle is right? $c^2 = a^2+b^2$
3. How can you tell if a triangle is obtuse? $c^2 > a^2+b^2$
4. How do you tell if the sides even make a triangle? $a+b>c$
5. Questions????

Oct 18-2:38 PM

Assignment

Triangles Wkst 3

Oct 18-2:39 PM