




Geometry

7.2 Isosceles and Equilateral Triangles

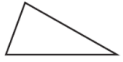
Triangle - a polygon with 3 sides 

equilateral - a polygon with all sides equal 

equiangular - a polygon with all angles equal 

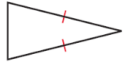
Classifying Triangles by Sides

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

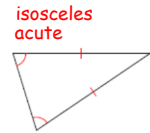
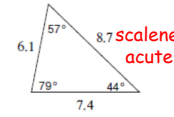
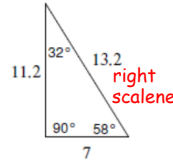
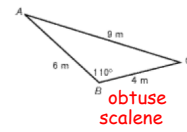
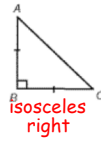
Equiangular Triangle







3 congruent angles

Classify the Triangle by its sides and angles

equiangular right acute
equilateral scalene obtuse isosceles







Classify by sides and angles

 <p>equilateral acute equilateral</p>	 <p>right scalene</p>
 <p>obtuse scalene</p>	 <p>obtuse scalene</p>


acute equilateral equiangular scalene right obtuse scalene isosceles

Classify by sides and angles

 <p>scalene acute</p>	 <p>right scalene</p>
 <p>right scalene</p>	 <p>isosceles acute</p>

scalene acute right scalene right scalene right scalene acute isosceles equilateral scalene equiangular isosceles


- Classify each triangle described.
- angles $30^\circ, 60^\circ, 90^\circ$ *right, scalene*
 - angles $40^\circ, 40^\circ, 100^\circ$ *obtuse, isosceles*
 - sides 15 cm, 15 cm, 15 cm *equiangular, equilateral, acute*



This is an equilateral triangle. What is another name for this triangle?

- A Equiangular
- B Acute
- C Obtuse
- D Scalene
- E A & B


E

 Which of the following statements about this triangle is *not* true?

- A This triangle has two sides that are congruent.
- B This triangle could be called an *acute triangle*.
- C This triangle could be called a *scalene triangle*.
- D All three angles in this triangle are less than 90° .

C

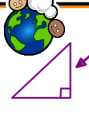
Answer

 Because of the measure of the third interior angle, this triangle is called....

- 1 A Obtuse
- 2 B Acute
- 3 C Scalene
- 4 D Equiangular

A


Answer

 This is a *right triangle*. It could also be called an *isosceles triangle*. Why?

- 1 A Because it has three sides that are a different length.
- 2 B Because it has an interior angle that measures less than 90° .
- 3 C Because it has two sides that are congruent.

C

Answer

 Which of the following is the correct classification for this triangle?

- 1 A Obtuse Isosceles
- 2 B Acute Scalene
- 3 C Obtuse Scalene
- 4 D Right Isosceles

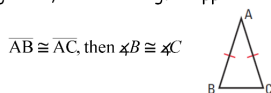
C

Answer

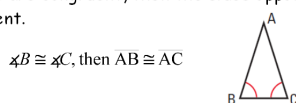
base angles: the 2 angles adjacent to the base
vertex angle: the angle formed by the legs



Base Angles Theorem: If 2 sides of a triangle are congruent, then the angles opposite them are congruent.



Converse of the Base Angles Theorem: If 2 angles of a triangle are congruent, then the sides opposite them are congruent.

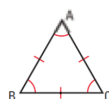


Corollary to the Base Angles Theorem

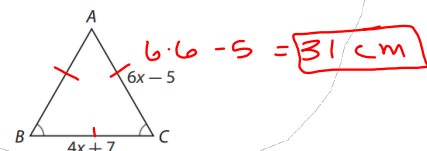
If a triangle is equilateral, then it is equiangular.

Corollary to the Converse of Base Angles Theorem

If a triangle is equiangular, then it is equilateral.



A Katie is stitching the center inlay onto a banner that she created to represent her new tutorial service. It is an equilateral triangle with the following dimensions in centimeters. What is the length of each side of the triangle?



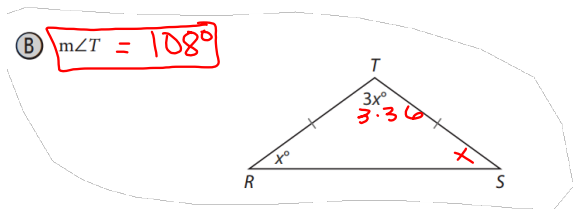
$$4x + 7 = 6x - 5$$

$$-4x + 5 \quad -4x + 5$$

$$12 = 2x$$

$$x = 6$$

31 cm



$$3x + x + x = 180$$

$$5x = 180$$

$$x = 36$$

Try This:

5. Find $m\angle P = 57^\circ$

$$3x + 3 + 3x + 3 + 5x - 2 = 180$$

$$11x + 4 = 180$$

$$11x = 176$$

$$x = 16$$

$3 \cdot 16 + 3$

6. Katie's tutorial service is going so well that she is having shirts made with the equilateral triangle emblem. She has given the t-shirt company these dimensions. What is the length of each side of the triangle in centimeters?

$$\frac{3}{10}y + 9 = \frac{4}{5}y - 1$$

$$-\frac{4}{5}y$$

$$\frac{3}{10}y + 9 = -1$$

$$-\frac{10}{5} \cdot -\frac{5}{10}y = -10 \cdot -\frac{10}{5}$$

$$y = 20$$

$\frac{4}{5} \cdot 20 - 1$
 $16 - 1$

15 cm

Homework

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