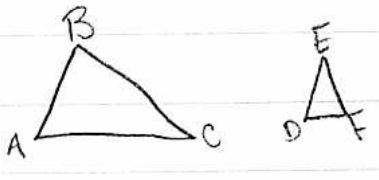
Geo 4

Triangles - Naming & Classifying

Remember we use capital letters to label vertices. We can use these labels to name triangles.

ex 

name them △ABC and △DEF

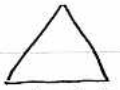
Two ways to classify △.

Equilateral triangle (all sides = length)

Isosceles triangle (at least 2 sides = length)

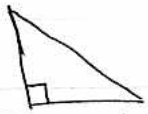
Scalene triangle (no sides = length)

OR

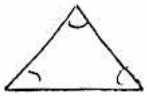


Acute triangle (all angles acute)

Obtuse triangle (has one obtuse angle)



Right triangle (has right angle)



Equiangular tri (has 3 equal angle

hypotenuse - the longest side of a right triangle (always "opposite" the right angle)

legs - two shorter sides of a right triangle. (always "adjacent" to the right angle)

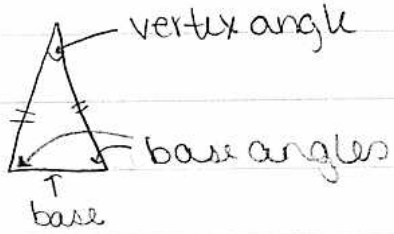
Properties of Isosceles Triangle

Vertex angle - angle formed by the sides of equal length in an isosceles triangle.

base angles - angles formed by the sides of unequal length in an isosceles triangle.

base - side of unequal length.

(ex)



Isosceles Triangle Theorem

If two sides of a triangle are congruent, then the angles opposite those sides are congruent (the base angles have the same measure.)

The converse is also true

If two angles of a triangle are congruent then the triangle is isosceles (opposite sides are ≅)

(ex.)

$m(\angle A) = 55°$

then $\overline{AB} \cong \overline{AC}$

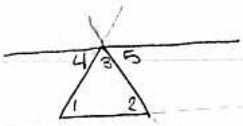
so

The Sum of the Measures of the Angles of a Triangle

Angles of a triangle

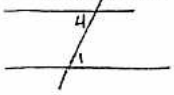
The sum of the angle measures of any triangle is 180°.

Proof



$m(\angle 4)+m(\angle 3)+m(\angle 5)=180°$

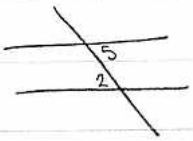
$\angle 1 \cong \angle 4$ are AIA.



$m(\angle 1)+m(\angle 3)+m(\angle 5)=180°$

$m(\angle 1)+m(\angle 3)+m(\angle 2)=180°$

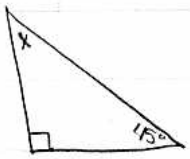
$\angle 2, \angle 5$ are AIA



You can test this using a protractor.

We can use this to find measures

ex.

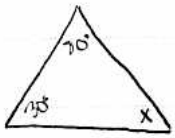


find x?

$x+45°+90°=180°$

$x+135°=180°$

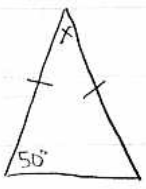
$x=45°$



$80°+30°+x=180°$

$110°+x=180°$

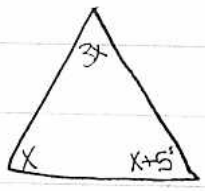
$x=70°$



$50°+50°+x=180°$

$x=80°$

ex:



$3x + x + x + 5 = 180°$

$5x + 5 = 180°$

$5x = 175°$

$x = 35°$

so $3(35) = 105°$

$35° + 5° = 40°$

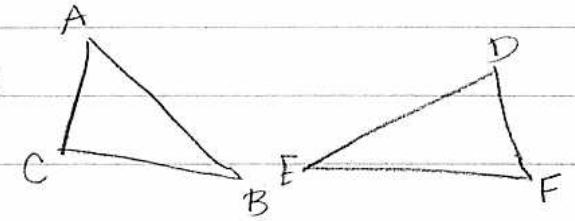
$35°$

Congruent Triangles

Congruent Triangles - triangles that are exactly alike, denoted $\triangle 1 \cong \triangle 2$

In congruent triangles, the sides "match up" and the angles "match up"

(ex)



$\triangle ABC \cong \triangle DEF$

this means $m(\overline{AB}) = m(\overline{DE})$

$m(\overline{BC}) = m(\overline{EF})$

$m(\overline{CA}) = m(\overline{FD})$

and

$m(\angle A) = m(\angle D)$

$m(\angle B) = m(\angle E)$

$m(\angle C) = m(\angle F)$