

## Good morning

- No journal today (Monday)
- Have homework out (will turn in)
- Important announcement re: test next week (changes to calendar)

## Goals

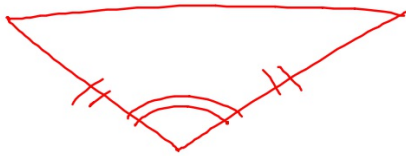
- Solidifying understanding of Triangle Classifications
- Exterior angle theorem: review
- Triangle angle sum and algebra
  
- New stuff:
  - The basics of proof: Statements and Reasons
  - “Given”
  - The Transitive Property
  - The Reflexive Property

# Triangle Classifications

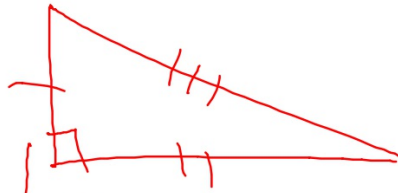
- Two different ways to classify: side lengths and angle measures
- Side length:
  - All sides are the same: equilateral
  - No sides are the same: scalene
  - Two sides are the same: isosceles
- Angle Measure: the biggest angle wins
  - Obtuse: largest angle is more than 90
  - Right: largest angle is equal to 90
  - Acute: largest angle is less than 90

ISOS  
SCALENE  
EQUILATERAL

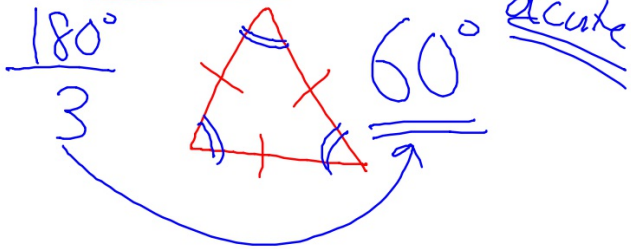
① Isosceles obtuse.



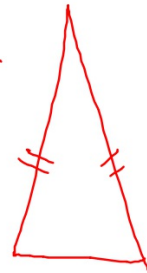
② Right Scalene



③ Equilateral

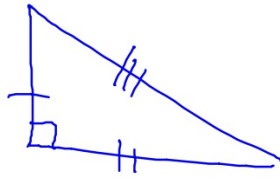


④ Isosceles Acute.

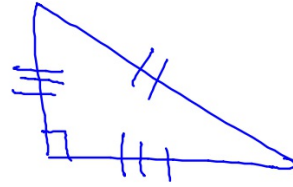
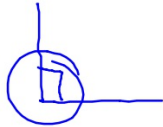


⑤ ~~Equilateral Obtuse.~~ impossible

① Scalene  
Right.



② Isosceles  
Right:



③ Equilateral.

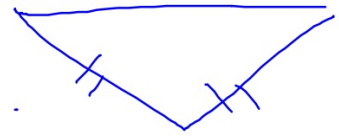


$$\frac{180}{3} = 60^\circ$$

Acute: 60°

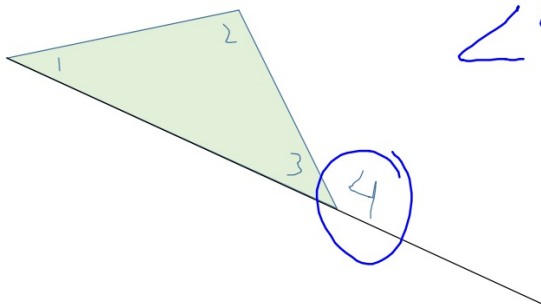
④ ~~Obtuse  
Right~~  $\Delta$ .

⑤ Isosceles  
Obtuse.



## Exterior Angle Sum

- The measure of an exterior angle of a triangle is equal to the sum of the measures of the two remote interior angles ("the other 2 angles")



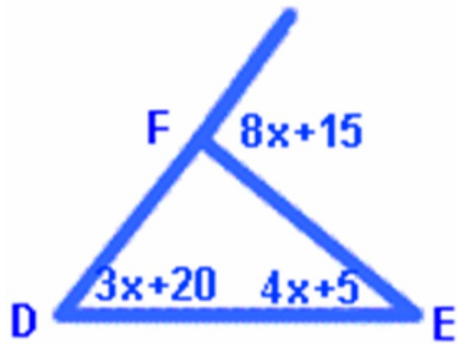
$$\angle 4 = \angle 1 + \angle 2.$$

## Example

find  $x$ :

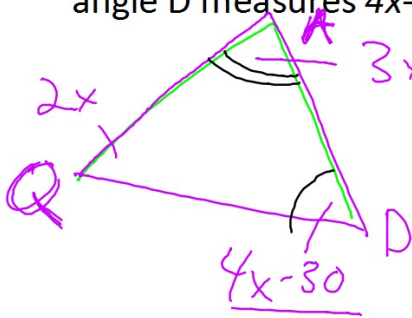
$$\underline{3x+20} + \underline{4x+5} = 8x+15$$

$$\underline{x=10}$$



## Triangle Angle Sum Algebra

- In Triangle QAD, angle Q measures  $2x$ , angle A measures  $3x-15$ , and angle D measures  $4x-30$ . Find the actual measures of each angle.



$$\checkmark 2x + 3(x-15) + 4(x-30) = 180 \checkmark$$

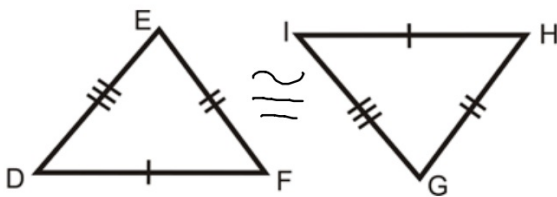
$-45$        $225$

$x = 25$

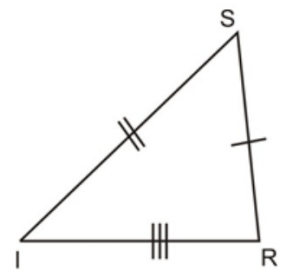
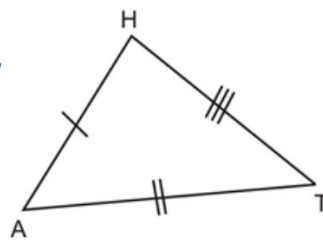


# Triangle Congruence

Write a "congruence statement"  $\Delta ABC \cong \Delta DEF$



$$\Delta FED \cong \Delta HGI$$



$$\Delta AHT = \Delta SRI.$$

## New stuff

- How to write a geometric proof:
  - Two columns
- First Reason should always be “Given”
  - Starting with provided information, list under Statements
- Final Statement should always be what was to be proven
  - The final reason will differ from problem to problem

<u>Statements</u>	<u>Reasons</u>
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## Important reasons to remember

- The transitive property
  - For example
    - $\sphericalangle A \cong \sphericalangle E$
    - $\sphericalangle E \cong \sphericalangle F$
    - So....

## Important reasons to remember

- The reflexive property
  - “Reflection”
  - Used when two shapes/triangles share a side, so it is congruent to itself