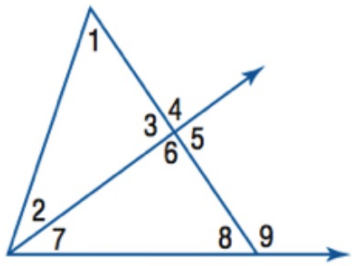
Geometry: Bell Work

Use the Exterior Angle Inequality Theorem to list all of the angles that satisfy the stated condition.



1. measures less than $m\angle 4$ 1, 2
2. measures greater than $m\angle 7$ 5, 9, 3
3. measures greater than $m\angle 2$ 4, 6
4. measures less than $m\angle 9$ 7, 6, 1, 2

Exterior angle is **greater than** either remote interior angle

We have seen that the biggest sides are opposite the biggest angles and the smallest sides are opposite the smallest angles.

Now we will explore the relationships between the *lengths* of triangles.

G -CO.C.10 Prove theorems about triangles.

Triangle Inequality Task

During this activity, you will compare the sum of the measures of any two sides of a triangle with the measure of the third side.

Sides that create a triangle

SMALL	MEDIUM	LARGE	SMALL + MEDIUM

What do you notice?

Sides that ***do not*** create a triangle

SMALL	MEDIUM	LARGE	SMALL + MEDIUM

What do you notice?

Geometry: Bell Work

Sides that create a triangle

SMALL	MEDIUM	LARGE	SMALL + MEDIUM
5	5	5	10
6	9.5	13	15.5

Sides that ***do not*** create a triangle

SMALL	MEDIUM	LARGE	SMALL + MEDIUM
2	5	12	7
8	13	23	21

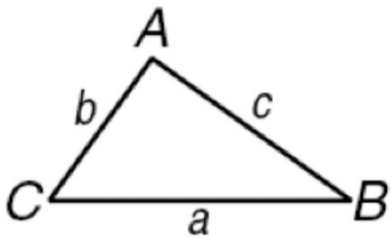
In your own words:

How can you tell if it is possible to make a trialgle from three given lengths?

5-5 Triangle Inequality

Objective – Apply the triangle inequality theorem

Triangle Inequality Theorem
The **sum** of the lengths of any **two sides** of a triangle is **greater** than the length of the **third side**.



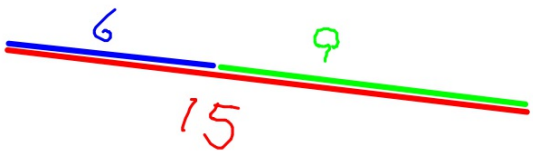
$a+b > c$
$a+c > b$
$b+c > a$

all must be true.

Determine whether the given measures can be the lengths of the sides of a triangle.

3, 4, 6 Yes $3+4>6$, $7>6$

6, 9, 15 No $6+9=15$



Find the range for the measure of the third side given the measures of two sides.
(Hint: Subtract the two numbers, then add the two numbers)

1 and 6

$1 + 6 > c$

$7 > c$

$1 + c > 6$

$-1 \qquad -1$

$c > 5$

$5 < c < 7$

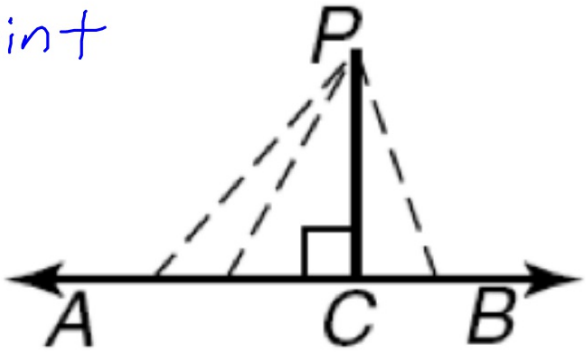
12 and 18

$18 - 12$ $\qquad$ $18 + 12$

$6 < c < 30$

The **perpendicular segment** from a point to a line is the **shortest segment** from the point to the line.

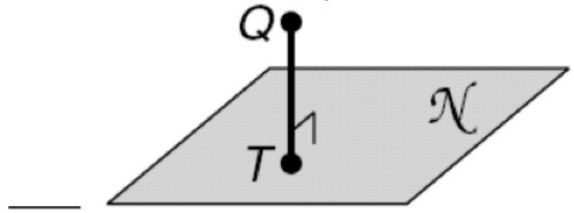
This is the distance between the point and the line



$\overline{PC}$ is the shortest segment from P to $\overleftrightarrow{AB}$

The **perpendicular segment** from a point to a plane is the **shortest segment** from the point to the plane.

This is the distance between the point and the plane.



$\overline{QT}$ is the shortest segment from Q to plane $\mathcal{N}$.

Is it possible to form a triangle with the given side lengths? If not, explain why not.

3. 8, 8, 8

Yes

4. 2, 4, 5 $2+4>5$

Yes

Find the range for the measure of the third side of a triangle given the measures of two sides.

9. 1.5 ft and 5.5 ft

$1.5+5.5=7$

$5.5-1.5=4$

$4<c<7$

10. 82 m and 8 m

$82+8=90$

$82-8=74$

$74<c<90$

Assignment:

5.5 pg 363 # 6-17