Friday, November 9, 2012

Agenda:

- TISK; No MM.
- Lesson 5-6: Compare side lengths and measures using the Hinge Theorem.
- Homework: 5-6 Worksheet

TISK Problems

1) Simplify: $\frac{90}{\sqrt{21}}$

2) Simplify: $\sqrt{1352}$

Homework Check

1) $AC < BC < AB$
2) $RT < RS = ST$
3) $KJ < KH < JH$
4) $AB < BC < AC$
5) $DF < DE < EF$
6) $HJ < GJ < GH$
7) $m\angle C < m\angle A < m\angle B$
8) $m\angle R < m\angle P < m\angle Q$
9) $m\angle H < m\angle G < m\angle F$
10) $m\angle L < m\angle K < m\angle M$
11) $m\angle N < m\angle Q < m\angle P$
12) $m\angle T < m\angle S < m\angle R$
13) $x = y + z$
14) $x > y \text{ and } x > z$ **OR** $y < x \text{ and } z < x$
15) $x < 7$
16) $x < 7$
17) Oak Hill Ave, Pleasant St, and the path through the center create a triangle. Let x = the distance along Oak Hill Ave, y = the distance along Pleasant St, and z = the distance along the path. From the Triangle Inequality, we know that $x + y > z$. Therefore, the path must be shorter than walking on the sidewalks.

§5.6 Indirect Proof & Inequalities in Two Triangles

- Indirect Proof
  - Up until now, all our proofs have been direct.
  - With Indirect Proof things work a little differently.
    - Identify the statement you want to prove is true.
    - Begin by assuming it is false; assume the opposite is true.
    - Obtain statements that logically follow from your assumption.
    - If you end at a contradiction, then the original statement must be true.

Example 1. Given a triangle. Prove that it has, at most, one obtuse angle.

Statement we are trying to prove:

A triangle has no more than one obtuse angle.

Assume the opposite is true:

A triangle may have more than one obtuse angle.

Statements	Reasons
In a triangle, $m\angle 1 > 90^\circ$ and $m\angle 2 > 90^\circ$	**Assumed**
$m\angle 1 + m\angle 2 > 180^\circ$	**Addition Property**
$m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$	**Δ Sum Th.**
$m\angle 1 + m\angle 2 = 180^\circ - m\angle 3$	**Subtraction Property of =**
$180^\circ - m\angle 3 > 180^\circ$	**Substitution**
$-m\angle 3 > 0^\circ$ $m\angle 3 < 0^\circ$	**Subtraction Property of =** **÷ Property of =**

The last statement is NOT POSSIBLE; angle measures in a triangle cannot be negative.

Therefore, our original assumption must be FALSE.

Example 2. Prove that there is at most one line through a point that is perpendicular to a given line.

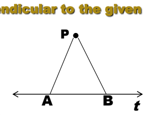
Statement we are trying to prove:

Given a line and a point not on that line, there is only one line through that point that is perpendicular to the given line.

Assume the opposite is true:

Through a point there is more than one line perpendicular to the given line.

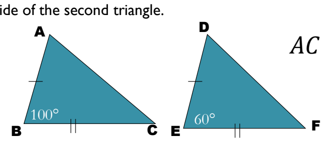
Statements	Reasons
$\overline{PA} \perp \overline{AB}$ and $\overline{PB} \perp \overline{AB}$	**Assumed**
P, A, and B are 3 noncollinear points and form a Δ	**Definition of a Triangle**
$\angle PBA$ and $\angle PAB$ are Rt. $\angle$s	**Def. Perpendicular**



The last statement is NOT POSSIBLE; a Δ may not contain more than 1 right ∠.
Therefore, our original assumption must be FALSE.

Theorems

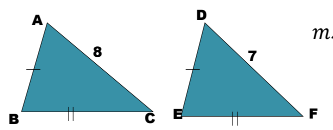
- Hinge Theorem
  - If two sides of one triangle are congruent to two sides of another triangle,
  - and the included angle of the first triangle is larger than the included angle of the second triangle,
  - then, the third side of the first triangle is longer than the third side of the second triangle.



$AC > DF$

Theorems

- Converse of the Hinge Theorem
  - If two sides of one triangle are congruent to two sides of another triangle,
  - and, the third side of the first triangle is longer than the third side of the second triangle
  - then, the included angle of the first triangle is larger than the included angle of the second triangle.



$m\angle B > m\angle E$

Monday, November 12, 2012

- Agenda
  - TISK & MM
  - Complete Lesson 5-6
  - Homework: Finish Worksheet 5-6/Study for Quiz tomorrow

TISK Problems

1) Simplify: $\frac{15}{\sqrt{50}}$

2) Simplify: $\left(x - \sqrt{15}\right)^2$

3) Factor completely: $12x^2 + 29x - 8$

We will have 2 Mental Math problems today.

If you have a signed quiz or test to show me, have it out when I come to your seat.

Homework Check

- Indirect Proof #16:

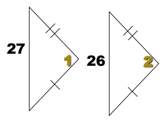
Statements	Reasons
1. $m\angle D > m\angle E$	1. Given
2. $EF = DF$	2. Assumed
3. $\overline{EF} \cong \overline{DF}$	3. Def. ≅ Segments
4. $\angle D \cong \angle E$	4. Isosceles Triangle Th.
5 $m\angle D = m\angle E$	5. Def. ≅ ∠s

Statement 1 & Statement 5 are contradictions.

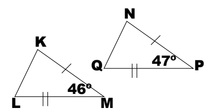
Statements	Reasons
1. $m\angle D > m\angle E$	1. Given
2. $EF < DF$	2. Assumed
3. $m\angle D < m\angle E$	3. If 1 side of a Δ is longer than another side, then the ∠ opp. the longer side is larger than the angle opposite the shorter side.

Statement 1 & Statement 3 are contradictions.

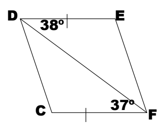
Examples. Complete each statement with <, >, or =.



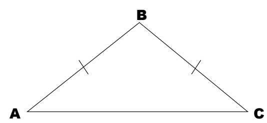
$m\angle 1$ ______ $m\angle 2$



KL ______ NQ

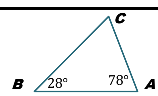


DC ______ FE



$m\angle A$ ______ $m\angle C$

Given: ΔABC
Prove: $BC > AC$



What would you have to prove using an indirect proof?

BC = AC is false **BC < AC is false.**

Quiz Tomorrow

- Have your homework for 5-4, 5-5, and 5-6 ready to turn in with your quiz.
- Chapter 5 Test is on Wed., Nov. 28th.