HW #1 - due Fri 11/6
- Read Ch 1
- Ch 1 Review Problems pp. 36-38 #1-30

Quiz #1 - Thur, 11/12
- Vocab
- Fill in the blank proofs

HW #2 - due Fri, 11/13
- Read Ch 2
- **Ch 2 Review Problems pp. 71-74 #1-19, 31-49**

HW #3 - due Wed, 11/18
- Read Ch 3
- **Ch 3 Review Problems pp. 124-128 #17-31, 34-49**

Test #1 - Thur, 11/19

Consider the following conditional statement:

If three points are noncollinear, then they determine a plane.

1. Identify the hypothesis: If a, then b

2. Identify the conclusion:

3. Draw a Euler diagram depicting the statement.

4. Write the converse of the statement: If b, then a
If three points determine a plane, then they are noncollinear.

5. Write the contrapositive of the statement. If not b, then not a.
If three points do not determine a plane, then they are collinear.

Complete the statement of the properties of equality by filling in the blank(s) with the missing word(s) or mathematical expressions.

6. Reflexive Property: For any real number a, $a = a$.

7. Substitution Property: For any real numbers a and b, if $a = b$, then a may be replaced by b in any equation.

8. Consider the direct proof using the following two premises. What is the theorem that they prove?

If NASA launched some cows into space, they would be put into low earth orbit. $a \rightarrow b$
If some cows were put into low earth orbit, they would be the herd shot around the world. $b \rightarrow c$

If Nasa launched some cows into space, they would be the herd shot around the world.

Fill in the missing statements for the indirect proof of the following theorem.

Background: Mr. Boddy was murdered after 4pm.
Theorem: Colonel Mustard killed Mr. Boddy.

Proof:

9. Suppose colonel Mustard did not kill Mr. Boddy.

If Colonel Mustard didn't do it, then Miss Scarlet did it.

10. If Miss Scarlet did it, it was done in the dining room.

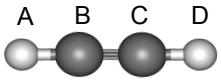
If it was done in the dining room, then it happened before noon.

11. This contradicts that the murder occurred after 4 pm.

12. Therefore, our assumption is false and hence Colonel mustard did indeed kill Mr. Boddy.

Acetylene molecules contain four atoms, arranged linearly.

34. In this molecule, AB=CD, A-B-C and B-C-D. Use these facts to supply the reasons in the following direct proof that AC=BD.



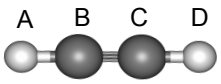
Proof:

Statements	**Reasons**
AB=CD (1)	Given
AB+BC=BC+CD (2)	addition
A-B-C and B-C-D (3)	given
AB+BC=AC and BC+CD=BD (4)	Betweenness of points theorem
Therefore, AC=BD	substitution (#2 & #4)

Acetylene molecules contain four atoms, arranged linearly.

34. In this molecule, AB=CD, A-B-C and B-C-D. Use these facts to supply the reasons in the following direct proof that AC=BD.

35. Use the additional fact that AC>2AB to supply the missing statements and reasons in this indirect proof that B is *not* the midpoint of AC.



Proof:

Statements	**Reasons**
Suppose B is the mid point of AC	Assumption
If B is the midpoint of AC, then AB=BC.	definition of midpoint
Because AB+BC=AC, 2AB=AC.	betweenness of points theorem
AB+AB=AC This contradicts that AC>2AB	substitution (2 & 3) & Multiplication Property
Therefore, our assumption is false and B is not the midpoint of AC.	Hypothesis

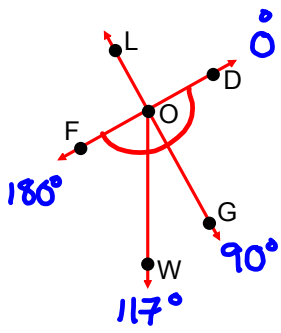
3.5 – Complementary and Supplementary Angles

Def: Two angles are complementary iff their sum is 90°.

Def: Two angles are supplementary iff their sum is 180°.

Theorem 3: Complements of the same angle are equal. (proved on p.106)

Theorem 4: Supplements of the same angle are equal.



If a protractor is placed on the figure so that OD has coordinate 0, the coordinates of the other rays are:
OG, 90; OW, 117; OF, 180.

16. Write the equation that follows from the fact that OD-OW-OF.

$\angle DOW + \angle WOF = \angle DOF$

17. Find the measures of ∠DOW 117°
∠WOF 63°
∠DOF 180°

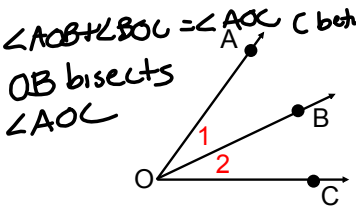
18. What relation does ∠DOW have to ∠WOF?

supplementary

19. Find the measure of ∠WOG

27°

20. What relation does ∠WOG have to ∠WOF? complementary



$\angle AOB + \angle BOC = \angle AOC$ (betweenness of rays thm)

OB bisects $\angle AOC$

$\angle 1 + \angle AOC = 90°$

$\angle 2 + \angle AOC = 90°$

In the figure, $\angle 1$ and $\angle 2$ are both complements of $\angle AOC$.

44. What else is true?

$\angle 1 = \angle 2$ (complements of same angle are equal)

45. Is it possible to figure out the size of each angle in the figure without measuring them?

$\angle AOC + \angle BOC = 90°$ } (complements

$\angle AOC + \angle AOB = 90°$ } complements of same $\angle$ are equal

$\angle BOC = \angle AOB$

$\angle AOB + \angle BOC = \angle AOC$ betweenness of rays

$\angle BOC + \angle BOC = \angle AOC$ subst. (#3 & 4)

$\angle BOC + \angle BOC + \angle BOC = \angle AOC + \angle BOC$ (addition)

$3\angle BOC = 90°$ simplification & substitution (#1 & 6)

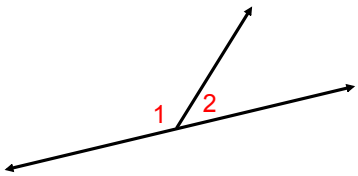
$\angle BOC = 30°$ division

$\angle AOB = 30°$

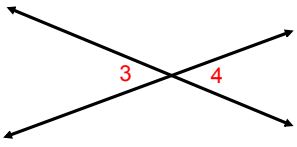
$\therefore$

3.6 – Linear Pairs and Vertical Angles

Def: Two angles are a linear pair iff they have a common side and their other sides are opposite rays.



Def: Two angles are vertical angles iff the sides of one angle are opposite rays to the sides of the other.



Theorem 5: The angles in a linear pair are supplementary.

Given: ∠1 and ∠2 are a linear pair.

Prove: ∠1 and ∠2 are supplementary.

Proof:

Statements	**Reasons**
1. ∠1 and ∠2 are a linear pair.	
2. Rays OA and OC are opposite rays.	If two angles are a linear pair, they have a common side and their other sides are opposite rays.
3. Let the coordinates of OA, OB, and OC be 0, n, and 180.	
4. ∠1=n-0=n° and ∠2=(180-n)°	
5. ∠1+∠2= n°+(180-n)°= 180°	Addition
6. ∠1 and ∠2 are supplementary.	Two angles are supplementary if their sum is 180°.

Theorem 6: Vertical angles are equal.

3.7 – Perpendicular and Parallel Lines

Def: Two lines are perpendicular iff they form a right angle.

Theorem 7: Perpendicular lines form four right angles.

Corollary to the definition of a right angle: All right angles are equal.

Theorem 8: If the angles in a linear pair are equal, then their sides are perpendicular.

Def: Two lines are parallel iff they lie in the same plane and do not intersect.