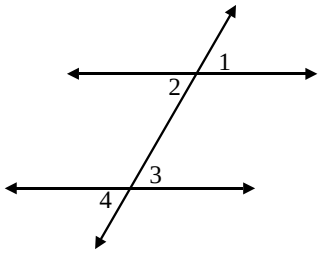
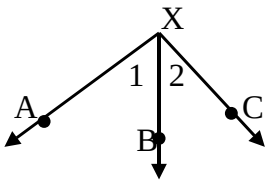


IV. Given: $\angle 2 \cong \angle 3$

Prove: $\angle 1 \cong \angle 4$

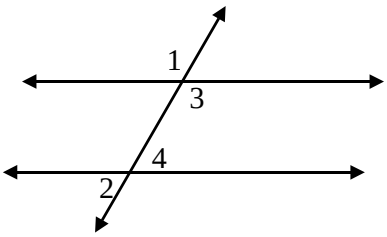
1. $\angle 1 \cong \angle 2$	1.
2. $\angle 2 \cong \angle 3$	2.
3. $\angle 3 \cong \angle 4$	3.
4. $\angle 1 \cong \angle 4$	4.



V. Given: $\angle 1$ and $\angle 2$ are complementary

Prove: $\overrightarrow{XA} \perp \overrightarrow{XC}$

1. $\angle 1$ and $\angle 2$ are complementary	1.
2. $m\angle 1 + m\angle 2 =$ _____	2.
3. $m\angle AXC = m\angle 1 + m\angle 2$	3.
4. $m\angle AXC =$ _____	4.
5. $\angle AXC$ is a right angle	5.
6.	6.



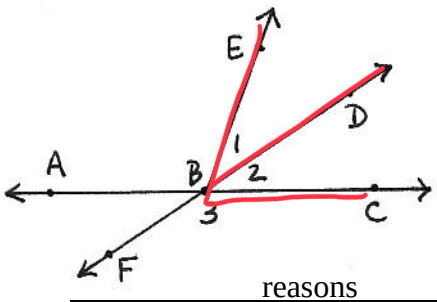
VI. Given: $\angle 1$ and $\angle 2$ are supplementary

Prove: $\angle 3$ and $\angle 4$ are supplementary

1. $\angle 1$ and $\angle 2$ are supplementary	1. Given
2. $\angle 1 + \angle 2 = 180°$	2. Def. of supplementary angles
3. $\angle 1 \cong \angle 3$ & $\angle 2 \cong \angle 4$	3. Vertical angles are congruent
4. $\angle 1 = \angle 3$ & $\angle 2 = \angle 4$	4. Def. of congruent angles
5. $\angle 3 + \angle 4 = 180°$	5. Substitution
6. $\angle 3$ and $\angle 4$ are supplementary	6. Def. of supplementary

VII. Given: $\overrightarrow{BD}$ bisects <EBC

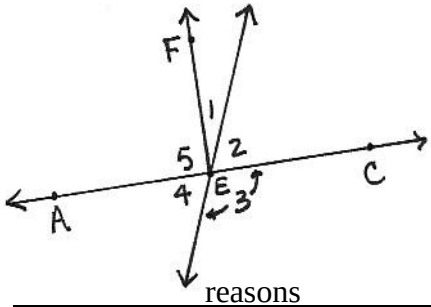
Prove: <1 and <3 are supplementary



statements	reasons
1. $\overrightarrow{BD}$ bisects <EBC	1. Given
2. <1 ≅ <2	2. Definition of bisector
3. <2 and <3 form a linear pair	3. Def of linear pair
4. m<2 + m<3 = 180	4. Def of linear pair
5. m<1 = m<2	5. Def of congruency
6. m<1 + m<3 = 180	6. substitution
7. <1 and <3 are supplementary	7. Def supplementary

VIII. Given: <FEC is a right angle

Prove: <1 and <4 are complementary



statements	reasons
1. <FEC is a right angle	1.
2. m<FEC = 90	2.
3. m<FEC = m<1 + m<2	3.
4. m<1 + m<2 = 90	4.
5. <2 ≅ <4	5.
6. m<2 = m<4	6.
7. m<1 + m<4 = 90	7.
8. <1 and <4 are complementary	8

Geometry Chapter 2 Pre-Test

1.) (16 pts total, 4 pts each) (2.1 Conditional Statements) For each statement, identify both the conclusion and hypothesis, provide the converse, and assess the validity of the converse statement.

a) If yogurt is green and smells weird, then you probably should not eat it.

hyp conc.

Converse: If you probably shouldn't eat it, then yogurt is green and smells weird

b) If you pee in the bathtub, then you have done something very wrong.

hyp conc.

Converse: If you have done something very wrong, then you have peed in the bath tub.

c) If you are eating a delicious burrito, then you are eating Mexican food.

d) If $x = 5$, then $x^2 = 25$

hyp conc

Converse: If $x^2 = 25$, then $x = 5$

False counterexample $x = -5$

2.) (16 pts total, 4 pts each) (2.2 Biconditionals and Definitions) Each conditional statement is true. Write and consider the converse. If the converse is true, combine the statements and write them as a biconditional.

a) If you are a fan of the Boston Red Sox, then you are a fan of the 2018 World Series Champions.

b) If you are friends with Nate, then you are accustomed to disappointment.

hyp conc.

Converse: If you are accustomed to disappointment, then you are friends with Nate.

c) If you are ~~Jeff Bezos~~ Elon Musky, then you are the richest ~~man~~ thing in the world.

hyp conc.

Converse: If you are the richest thing in the world, then you are Elon Musky.

d) If you own a raccoon, then you have made a poor decision.

True! Biconditional statement:
you are the richest thing in the world, if, and only if, you are Elon Musky.

3.) (8 pts total, 4 pts each) (2.3 Deductive Reasoning) Use the law of detachment to draw a conclusion. If not possible, write not possible.

a) If you are a fan of Macklemore, then you have poor taste in music.

Nate has poor taste in music.

No conclusion

b) If you say you're going to bring donuts and don't bring donuts, then Hannah is going to knock you out.

Nate said he was going to bring donuts and didn't.

Teagan is going to light Nate up!

4.) (8 pts total, 4 pts each) (2.3 Deductive Reasoning) Use the law of syllogism to draw conclusions from the following statements.

a) If Nate loses his hair, then he will be sad and depressed. If Nate is sad and depressed, then he will buy a Cold Stone Creamery franchise and eat ice cream all day every day.

Nate found two hairs on his desk.

Nate will buy CSC franchise and eat all the ice cream

b) If you do well in school, then you will go to college. If you go to college, then you will be more likely to have a successful, fulfilling professional career.

Charlie is doing well in school.

5.) (16 pts total, 8 pts each) (2.4 Reasoning in Algebra) Complete the following proofs.

a) Given: $8x + 3 = 43$
Prove: $x = 5$

Statement	Reasoning
1.) $8x + 3 = 43$	1.) Given
2.) $8x = 40$	2.) Sub PoE
3.) $x = 5$	3.) Div PoE

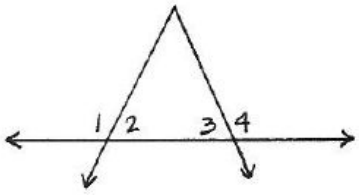
b) Given: $3(2a - 5) = 45$
Prove: $a = 10$

Statement	Reasoning
1.) $3(2a - 5) = 45$	1.) Given
2.) $6a - 15 = 45$	2.) Simplify or distribute
3.) $6a = 60$	3.) Add PoE
4.) $a = 10$	4.) Div PoE

b)

IX. Given: $\angle 2 \cong \angle 3$

Prove: $\angle 1 \cong \angle 4$



statements	reasons
1. $\angle 1$ and $\angle 2$ form a linear pair $\angle 3$ and $\angle 4$ form a linear pair	1. Def of linear pair
2. $\angle 1$ and $\angle 2$ are supp. $\angle 4$ and $\angle 3$ are supp.	2. Def of supplemental
3. $\angle 2 \cong \angle 3$	3. Given
4. $\angle 1 \cong \angle 4$	4. Substitution

$\angle 1 + \angle 2 = 180°$

$\angle 3 + \angle 4 = 180°$

$\angle 1 + \angle 2 = \angle 3 + \angle 4$

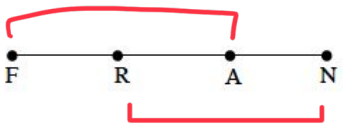
$\angle 1 + \angle 3 = \angle 3 + \angle 4$

$\angle 1 = \angle 4$

c)

Given: $\overline{FR} \cong \overline{AN}$

Prove: $\overline{FA} \cong \overline{RN}$



Statement	Reason
$\overline{FR} \cong \overline{AN}$	Given
$\overline{FR} + \overline{RA} = \overline{FA}$	Segment Add Post
$\overline{RA} + \overline{AN} = \overline{RN}$	SAP
$\overline{AN} + \overline{RA} = \overline{FA}$	Substitution
$\overline{FA} \cong \overline{RN}$	Substitution

optional