Geometry Test 3 Review

1. What is the next term in the sequence? $$1, \frac{1}{2}, \frac{1}{4}, \frac{1}{6}, \ldots$$ $\frac{1}{8}$	2. Which number serves as a counterexample to the statement below? All positive numbers can be divided by 2 or 3. <u>1</u> can't be divided by 3
3. Tony Romo concluded that for all positive values of x, $2x + 5$ produces a prime number. Give a counterexample to prove Romo false. $x = 2$ $2(2) + 5$ $= 4 + 5$ $= 9$ 9 is not prime	4. Give a counterexample that disproves each conjecture below. If $x^2 = 16$, then $x = 4$. $x = -4$ $-4^2 = 16$

5. For the conditional statement ($p \to q$) below, write the converse, the inverse and the contrapositive.

> If a triangle is isosceles, then it has two congruent sides.

Converse ($q \to p$):

If it has two congruent sides, then it is a isosceles triangle.

Inverse ($\sim p \to \sim q$):

if a triangle is not isosceles, then it doesn't have two congruent sides

Contrapositive ($\sim q \to \sim p$):

If it doesn't have two congruent sides, then it is not isosceles.

6. The statements below are out of order.

A: If cowboys, then eagles.

B: If red skins, then super bowl.

C: If eagles, then red skins.

D: If giants, then cowboys.

Which of the following puts the silly if-then statements in logical order?
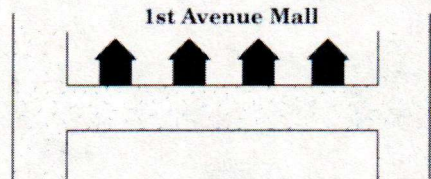
D → A → C → B

7. Consider the two statements below:
- If Tony Romo is not playing, then he is not well.
- Tony Romo is not here.

Assuming that these two statements are true, what conclusion can be made?

Tony Romo is not well.

8.

N
W - E
S

1st Avenue Mall

The Walmart is west of the Cowboy's Shop. The Cowboy's Shop is west of the Old Navy. Panera is east of the Old Navy.

Which of the following lists the stores in order from west to east?

9. Write the following definition as a biconditional:

An obtuse angle is an angle whose measure is greater than 90° but less than 180°.

An angle is obtuse if and only if

Its measure is greater than 90°

but less than 180°

10. Consider the sequence below:

10, 6, 2, −2, …

a) Find the next term in the sequence.

− 6

11. Write the following statement as a conditional statement.

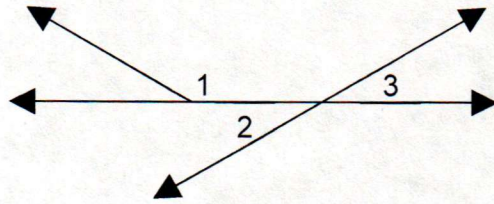Two angles that form a linear pair are supplementary.

If two angles form a linear

pair, then they are supplementary

12. Underline the hypothesis and circle the conclusion.

If you vote for Trump, then he will win.
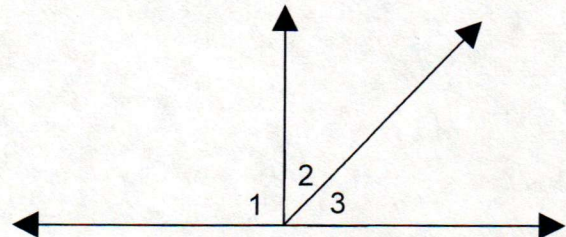
13. Complete the proof:

Given: ∠1 and ∠2 are supplementary
Prove: ∠1 and ∠3 are supplementary

Statements	Reasons
1. ∠1 and ∠2 are supp.	1. Given
2. $m\angle 1 + m\angle 2 = 180°$	2. Def of supp. ∠s
3. $m\angle 2 = m\angle 3$	3 Vertical ∠ Theorem
4. $m\angle 1 + m\angle 3 = 180°$	4. Subst. prop. =
5. ∠1 and ∠3 are supp.	5. Def of supp ∠s

14. Complete the proof:

Given: ∠1 is a right angle
Prove: ∠2 and ∠3 are complementary

Statements	Reasons
1. ∠1 is a right angle	1. Given
2. $m\angle 1 + m\angle 2 + m\angle 3 = 180°$	2. Def of straight ∠
3. $m\angle 1 = 90°$	3. Def of right ∠
4. $90° + m\angle 2 + m\angle 3 = 180°$	4. Subst. prop. =
5. $m\angle 2 + m\angle 3 = 90°$	5. Subtraction prop. =
6. ∠2 and ∠3 are comp.	6. Def comp ∠s

15. Put the following statements in order and write the conclusion:

__2__ If the Rangers are in first place then the Rangers will go to the playoffs.

__4__ If the Rangers win the World Series, then your teacher will get a Rangers tattoo.

__1__ If the Rangers win lots of games, then the Rangers will be in first place.

__5__ If your teacher gets a Rangers tattoo, then they will get fired.

__3__ If the Rangers go to the playoffs, then the Rangers will win the World Series.

Conclusion: If the Rangers win lots of games, then

If the Rangers win lots of games, then they will get fired.

16. Give a counterexample that disproves each conjecture below.

If I ate Mexican food, then I ate Taco Bell.

No I couldv'e ate Taco Casa wey

For 17-20, are the following statements made by Inductive or Deductive Reasoning?

17. Lamar has lost their last three games. Thus, they will probably lose their next game. I	18. If you brush and floss your teeth daily, then you will have fewer cavities. Marie brushes and flosses her teeth daily. Thus, she will have fewer cavities. D
19. All students go to school. You are a student. Therefore, you go to school. D	20. Obama will make a fine president. After all, he made a fine senator. I

21. For each conditional ($p \rightarrow q$) , write the converse, the inverse and the contrapositive.

       P

If <u>you are watching television</u>, then (you are not studying Geometry.)

Converse ($q \rightarrow p$):

If you are not studying Geometry, then you are watching T.V.

Inverse ($\sim p \rightarrow \sim q$):

If you are not watching T.V., then you are studying Geometry

Contrapositive ($\sim q \rightarrow \sim p$):

If you are studying Geometry, then you are not watching T.V.

For 22-24, rewrite each statement in if-then form. Underline the hypothesis once and circle the conclusion.

22. Today is Friday, and tomorrow is the weekend.	23. A high K/D means your good at video games.
If today is Friday, then tomorrow is the weekend	If you a high K/D, then that means your good at video games.

24. Write the biconditinal statement for:

If a triangle is equilateral, then it is equiangular.

Biconditional $(p \leftrightarrow q)$:

A triangle is equilateral if and only if it is equiangular.

Test 3 Vocabulary

Conjecture – An unproven statement that is based on observations

Inductive reasoning – A process that includes looking for patterns and making conjectures

Counterexample – A specific case for which a conjecture is false

Deductive reasoning – A process that uses facts, definitions, accepted properties, and the laws of logic to form a logical argument

Conditional Statement – A logical statement that has a hypothesis and a conclusion

If-then form – A conditional statement in the form "if p, then q"

Hypothesis – The "if" part of a conditional statement written in if-then form

Conclusion – The "then" part of a conditional statement written in if-then form

Converse – The statement formed by exchanging the hypothesis and conclusion of a conditional statement

Inverse – The statement formed by negation both the hypothesis and conclusion of a conditional statement.

Contrapositive – The statement formed by negating both the hypothesis and conclusion of the converse of a conditional statement.

Equivalent statement – Two related conditional statements that are both true or both false.

Negation – The opposite of a statement. If a statement is p, then the negation is "not p"

Biconditional statement – A statement that contains the phrase "if and only if"

Proof – A logical argument that uses deductive reasoning to show that a statement is true.

Two-column proof

Theorem – A statement that can be proven