Geometry Practice Test – Unit 2 ☺**Name: _____**☺
Logic, Reasoning and Proof **Date: _____ Pd: ____**

Definitions (1 - 4)

1) Postulate

2) Deductive Reasoning

3) Inverse

4) Counterexample

5) State the hypothesis and conclusion of the conditional statement:
"If I walk to school, then I will be late."

Hypothesis: _____

Conclusion: _____

6) Rewrite the statement in 'if-then' form:
"I will get paid my allowance when my chores are completed."

7) Write the definition of complementary angles as a true biconditional.

8) Write the converse, inverse and contrapositive of the true conditional statement. Determine the truth of each new statement:

"If it rains, then the game will be cancelled."

Converse: _____ T / F

Inverse: _____ T / F

Contrapostive: _____ T / F

9) Provide a counterexample to show that the statement is false.

"The sum of two fractions is always a fraction."

10) Draw a counterexample to show that the statement is false.

"Two lines always intersect."

11) Use inductive reasoning to predict the next two numbers in the patterns:

a) 1, 5, 9, 13, … _____, _____

b) 3, 4, 6, 9, 13, … _____, _____

c) 81, 27, 9, 3, … _____, _____

12) In class, Maria reads the theorem "Vertical angles are congruent." She notices in a diagram that $\angle 1$ and $\angle 2$ are vertical angles. Maria concludes that $\angle 1 \cong \angle 2$. This is an example of _____ reasoning.

13) On her way to the park, Jonna passes 4 black dogs. She conjectures that the next dog she passes will also be black. This is an example of _____ reasoning.

14) State the logical conclusion that follows from the statements and the law used to reach that conclusion. If no conclusion can be made, state "no conclusion":

a) Eric is younger than Jose. Conclusion: _____

Jose is younger than Zack. Law: _____

b) Elephants eat a lot. Conclusion: _____

Jumbo is an elephant. Law: _____

c) All cows have four legs. Conclusion: _____

Elsie has four legs. Law: _____

15) Justify each statement with a property from Algebra.

a) If $6x - 7 = 29$, then $6x = 36$. **a)** _____

b) If $6x = 36$, then $x = 6$. **b)** _____

c) $3(x + y) = 3x + 3y$ **c)** _____

d) If $x - 3 = 5$ and $x = 8$, then $8 - 3 = 5$ **d)** _____

16) Justify each statement with a property, definition or postulate from Geometry.

a) If $m\angle A = 90°$, then $\angle A$ is a right angle. **a)** _____

b) If $WX = XY$ and $XY = YZ$, then $WX = YZ$. **b)** _____

c) If $m\angle X = m\angle Y$, then $m\angle Y = m\angle X$. **c)** _____

d) Lines j and k intersect at R. **d)** _____

17) Write an algebraic proof. Justify each statement.

Given: $9(x - 4) = 7x - 20$

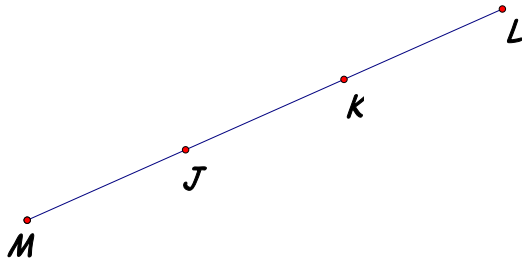
Prove: $x = 8$

18) Complete the proof:

Given: J is the midpoint of $\overline{MK}$,

K is the midpoint of $\overline{JL}$.

Prove: $\overline{MJ} \cong \overline{KL}$



1) J is the midpoint of $\overline{MK}$	1) _____
2) _____	2) Given
3) $\overline{MJ} \cong \overline{JK}$	3) _____
4) _____	4) Definition of midpoint
5) _____	5) _____

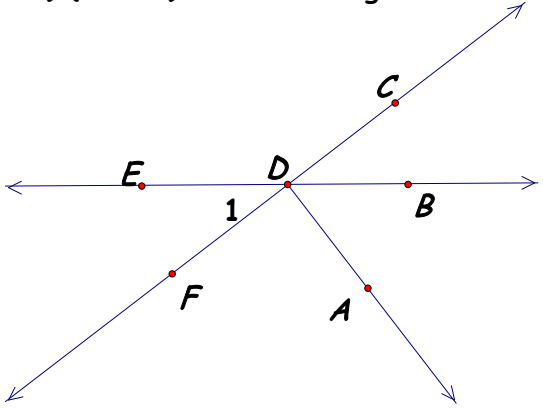
19) (LTMR) Given the points: $A(1, 7)$ and $B(-2, 11)$.

a) Find the midpoint of $\overline{AB}$. **a)** _____

b) Find C such that B is the midpoint of $\overline{AC}$. **b)** _____

c) Find AB. **c)** _____

20) (LTMR) Use the diagram to solve:



$\overleftrightarrow{AD} \perp \overleftrightarrow{FC}$ and $m\angle 1 = 38°$

a) $m\angle ADF =$ _____

b) $m\angle EDC =$ _____

c) $m\angle CDB =$ _____

d) $m\angle ADB =$ _____

21. In the pattern below, the sides of each square have a length of 1 unit.

Figure 1 

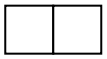
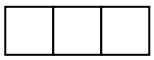
Figure 2 

Figure 3 

What is the perimeter of the n^{th} figure?

A. n

B. $2n$

C. $2n + 2$

D. $4n + 4$

22. Using the scientific method, conjectures are made based on observed patterns. What type of reasoning does the scientific method use?

A. deductive

B. hypothetical

C. inductive

D. scientific

23. Which can be written as a bi-conditional statement?

A. All donks are widgets.

B. All widgets are prings.

C. All donks and all widgets are prings.

D. All donks are widgets and all widgets are donks.

24. Which statement is the converse of *If x = 5, then x > 3*?

A. If $x > 3$, then $x = 5$.

B. If $x \leq 3$, then $x \neq 5$.

C. If $x \neq 5$, then $x \leq 3$.

D. If $x = 5$, then $x \leq 3$.

25. Which is the inverse of the statement: *If Jon lives in North Las Vegas, then he lives in Nevada*?

A. If Jon lives in Nevada, then he lives in North Las Vegas.

B. If Jon lives in North Las Vegas, then he does not live in Nevada.

C. If Jon does not live in Nevada, then he does not live in North Las Vegas.

D. If Jon does not live in North Las Vegas, then he does not live in Nevada.

26. Which is a counterexample to the statement: *All prime numbers are odd*?

A. 8 is even.

B. 7 is prime.

C. 5 is odd.

D. 2 is prime.

27. What is the n^{th} term of the sequence 1, 4, 7, 10, …?

A. $3n - 2$

B. $3n + 3$

C. $n - 1$

D. $n + 3$

28. On the way to the park, Colin passes 5 dogs that are all black with white spots. Using inductive reasoning, what prediction can he make about the next dog that he passes?

A. The dog will have four legs.

B. The dog's name will be Spot.

C. The dog will be white with black spots.

D. The dog will be black with white spots.

1. Given: $(x+5)(x+3) = x(x+13)$

Prove: $x = 3$

Supply reasons for each step.

NHSPE Review

2. The first five terms of a sequence are shown below.

8, 11, 17, 29, 53

The sequence continues. What is the sixth term of the sequence?