Class:

_____ Date: ____

Reasoning

1. Which statement is the Law of Detachment? A. If $p \to q$ and $q \to r$ are true, then $p \to r$ is a true statement. B. If $p \rightarrow q$ is a true statement and p is true, then q is true. C. If $p \rightarrow q$ is a true statement and q is true, then $q \rightarrow p$ is true. D. If $p \rightarrow q$ is a true statement and q is true, then p is true. 2. If possible, use the Law of Detachment to draw a conclusion from the two given statements. If not possible, write not possible. Statement 1: If x = 2, then 2x - 3 = 1. Statement 2: x = 2A. 2x - 3 = 1C. x = 2B. If 2x - 3 = 1, then x = 2. D. not possible 3. Use the Law of Detachment to draw a conclusion from the two given statements. If two angles are congruent, then they have equal measures. $\angle X$ and $\angle Z$ are congruent. C. $\angle X$ is the complement of $\angle Z$. A. $m \angle X + m \angle Z = 90$ D. $m \angle X = m \angle Z$ B. $m \angle X \neq m \angle Z$ 4. Use the Law of Detachment to draw a conclusion from the two given statements. If not possible, write not possible. I can go to the concert if I can afford to buy a ticket. I can go to the concert. A. I can afford to buy a ticket. B. If I can go to the concert, I can afford the ticket. C. I cannot afford to buy the ticket. D. not possible 5. Use the Law of Syllogism to draw a conclusion from the two given statements. If there is a storm, then there is thunder. If there is thunder, Li's dog is under her bed. A. If there is not a storm, Li's dog is not under her bed. B. Li's dog is under her bed. C. There is a storm. D. If there is a storm, then Li's dog is under her bed. 6. Which statement is the Law of Syllogism? A. If $p \rightarrow q$ is a true statement and p is true, then q is true. B. If $p \rightarrow q$ and $q \rightarrow r$ are true statements, then $r \rightarrow p$ is a true statement. C. If $p \rightarrow q$ and $q \rightarrow r$ are true statements, then $p \rightarrow r$ is a true statement. D. If $p \rightarrow q$ is a true statement and q is true, then p is true.

- 7. Use the Law of Syllogism to draw a conclusion from the two given statements. If two lines intersect and form right angles, then the lines are perpendicular.
 - If two lines are perpendicular, then they intersect and form 90° angles.
 - A. The lines are perpendicular.
 - B. If two lines do not intersect and form 90° angles, then they do not form right angles.
 - C. If two lines intersect and form right angles, then they intersect and form 90° angles.
 - D. The lines intersect and form 90° angles.
- 8. Use the Law of Detachment and the Law of Syllogism to draw a conclusion from the three given statements. If it is Friday night, then there is a football game.

If there is a football game, then Josef is wearing his school colors.

It is Friday night.

- A. Josef is wearing his school colors.
- B. If it is Friday night, then Josef is wearing his school colors.
- C. If it is not Friday night, then Josef is not wearing his school colors.
- D. There is a football game.
- 9. Use the Law of Detachment and the Law of Syllogism to draw a conclusion from the three given statements. If an elephant weighs more than 2000 pounds, then it weighs more than Jill's car. If something weighs more than Jill's car, then it is too heavy for the bridge.

Smiley the elephant weighs 2150 pounds.

- A. Smiley weighs more than Jill's car.
- B. Smiley is too heavy for the bridge.
- C. If Smiley weighs more than 2000 pounds, then Smiley is too heavy for the bridge.
- D. If Smiley weighs more than Jill's car, then Smiley is too heavy for the bridge.
- 10. For the given statements below, write the first statement as a conditional in if-then form. Then, if possible, use the Law of Detachment to draw a conclusion from the two given statements. If not possible, write *not possible*. Explain.

A straight angle has a measure of 180. $\angle R$ is a straight angle.

- 11. A plumber knows that if you shut off the water at the main valve, it is safe to remove the sink faucet. The plumber turns the main valve to the "off" position. What conclusion can the plumber make?
- 12. Use the Law of Detachment to draw a conclusion from the two given statements. If not possible, state *not possible*. Explain.

Statement 1: If two lines intersect, then they are not parallel. Statement 2: \overrightarrow{AB} and \overrightarrow{CD} do not intersect.

Reasoning Answer Section

- 1. B
- 2. A
- 3. D
- 4. D
- 5. D
- 6. C
- 7. C
- 8. A
- 9. B
- 10. If an angle is straight, then its measure is 180. Conclusion: $m \angle R$ is 180.
- 11. It is safe to remove the sink faucet.
- 12. Not possible. Explanations may vary. Sample: To use the Law of Detachment, you must know that the hypothesis is true.

ID: A