

### G.CO.C.9: Conditional Statements

- 1 Which statement is logically equivalent to “If I eat, then I live”?
  - 1) If I live, then I eat.
  - 2) If I eat, then I do not live.
  - 3) I live if and only if I eat.
  - 4) If I do not live, then I do not eat.
- 2 Which statement is logically equivalent to “If I did not eat, then I am hungry”?
  - 1) If I am not hungry, then I did not eat.
  - 2) If I did not eat, then I am not hungry.
  - 3) If I am not hungry, then I did eat.
  - 4) If I am hungry, then I did eat.
- 3 Which statement is logically equivalent to “If the team has a good pitcher, then the team has a good season”?
  - 1) If the team does not have a good season, then the team does not have a good pitcher.
  - 2) If the team does not have a good pitcher, then the team does not have a good season.
  - 3) If the team has a good season, then the team has a good pitcher.
  - 4) The team has a good pitcher and the team does not have a good season.
- 4 Given the true statement: “If a person is eligible to vote, then that person is a citizen.” Which statement must also be true?
  - 1) Kayla is not a citizen; therefore, she is not eligible to vote.
  - 2) Juan is a citizen; therefore, he is eligible to vote.
  - 3) Marie is not eligible to vote; therefore, she is not a citizen.
  - 4) Morgan has never voted; therefore, he is not a citizen.
- 5 Which statement is logically equivalent to “If it is Saturday, then I am not in school”?
  - 1) If I am not in school, then it is Saturday.
  - 2) If it is not Saturday, then I am in school.
  - 3) If I am in school, then it is not Saturday.
  - 4) If it is Saturday, then I am in school.
- 6 Which statement is logically equivalent to “If a triangle is an isosceles triangle, then it has two congruent sides”?
  - 1) If a triangle does not have two congruent sides, then it is an isosceles triangle.
  - 2) If a triangle does not have two congruent sides, then it is not an isosceles triangle.
  - 3) If a triangle is not an isosceles triangle, then it has two congruent sides.
  - 4) If a triangle is an isosceles triangle, then it does not have two congruent sides.
- 7 Which statement is logically equivalent to "If I am in a mathematics class, then I am having fun"?
  - 1) If I am not in a mathematics class, then I am not having fun.
  - 2) If I am having fun, then I am in a mathematics class.
  - 3) If I am not having fun, then I am not in a mathematics class.
  - 4) If I am in a mathematics class, then I am not having fun.
- 8 Which statement is logically equivalent to the statement “If you are an elephant, then you do not forget”?
  - 1) If you do not forget, then you are an elephant.
  - 2) If you do not forget, then you are not an elephant.
  - 3) If you are an elephant, then you forget.
  - 4) If you forget, then you are not an elephant.
- 9 Which statement is logically equivalent to the statement "If Corey worked last summer, he buys a car"?
  - 1) If Corey does not buy a car, he did not work last summer.
  - 2) If Corey buys a car, he worked last summer.
  - 3) If Corey did not work last summer, he does not buy a car.
  - 4) If Corey buys a car, he did not work last summer.

- 10 Which statement is logically equivalent to "If it is warm, then I go swimming"
- 1) If I go swimming, then it is warm.
  - 2) If it is warm, then I do not go swimming.
  - 3) If I do not go swimming, then it is not warm.
  - 4) If it is not warm, then I do not go swimming.

- 11 "If Tom and Mary are classmates, then they go to the same school." Which statement below is logically equivalent?
- 1) If Mary and Tom do not go to the same school, then they are not classmates.
  - 2) If Mary and Tom are not classmates, then they do not go to the same school.
  - 3) If Mary and Tom go to the same school, then they are classmates.
  - 4) If Mary and Tom go to the same school, then they are not classmates.

- 12 Which statement is logically equivalent to "If I sleep, then I will not eat"?
- 1) If I do not sleep, then I will eat.
  - 2) If I eat, then I will not sleep.
  - 3) If I eat, then I will sleep.
  - 4) If I do not eat, then I will sleep.

- 13 A conditional statement is always logically equivalent to its
- 1) contrapositive
  - 2) converse
  - 3) conjunction
  - 4) inverse

- 14 Consider the relationship between the two statements below.

$$\text{If } \sqrt{16+9} \neq 4+3, \text{ then } 5 \neq 4+3$$

$$\text{If } \sqrt{16+9} = 4+3, \text{ then } 5 = 4+3$$

These statements are

- 1) inverses
- 2) converses
- 3) contrapositives
- 4) biconditionals

- 15 Write a statement that is logically equivalent to the statement "If two sides of a triangle are congruent, the angles opposite those sides are congruent." Identify the new statement as the converse, inverse, or contrapositive of the original statement.

- 16 In the spaces provided below, write the converse, the inverse, and the contrapositive of the statement "If I run, then I am tired."

Converse:

Inverse:

Contrapositive:

- 17 Given the statement: "If I live in Albany, then I am a New Yorker." In the spaces provided below, write the inverse, the converse, and the contrapositive of this statement.

Inverse:

Converse:

Contrapositive:

Which conditional is logically equivalent to its original statement?

inverse                  converse                  contrapositive

**G.CO.C.9: Conditional Statements****Answer Section**

- 1 ANS: 4 REF: 060112a  
2 ANS: 3 REF: 080104a  
3 ANS: 1 REF: 010220a  
4 ANS: 1 REF: 010308a  
5 ANS: 3 REF: 060308a  
6 ANS: 2 REF: 060405a  
7 ANS: 3 REF: 010930a  
8 ANS: 4 REF: 010513a  
9 ANS: 1 REF: 080629a  
10 ANS: 3 REF: 081026ge  
11 ANS: 1 REF: spring9812a  
12 ANS: 2 REF: 080829a  
13 ANS: 1 REF: 060823a  
14 ANS: 1 REF: 011320ge  
15 ANS:

Contrapositive-If two angles of a triangle are not congruent, the sides opposite those angles are not congruent.

REF: fall0834ge

- 16 ANS:  
INVERSE: If I do not run, then I am not tired. CONVERSE: If I am tired, then I run. CONTRAPOSITIVE: If I am not tired, then I do not run.

REF: 010837a

- 17 ANS:  
INVERSE: If I do not live in Albany, then I am not a New Yorker. CONVERSE: If I am a New Yorker, then I live in Albany. CONTRAPOSITIVE: If I am not a New Yorker, then I do not live in Albany. The contrapositive is logically equivalent.

REF: 080739a