Course Information	Originating Course Information
Course: Concepts 2020	Course: Concepts Fundamentals
Unit: 2 LESIC	Unit: 2 LESIC
Assignment: 1: Disjunctions	Assignment: 1: Disjunctions

DISJUNCTIONS

In the previous lesson, we listed several ways that statements can be combined. In this lesson, we will explore some of those ways in some depth.

We can combine two statements in another way by using the word **or**:

For example:

3 × 2 = 5 or 7 · 7 = 49
12 - 5 = 7 or 5 · 5 = 0
5 · 3 = 15 or 7 > -2
16 · 3 = 48 or -6 < -10

These statements are of the form **p or q** where **p** represents the first statement and **q** the second statement. The new statement **p or q** is called the **disjunction of p and q**. It can be written **p v q**.

OBJECTIVES

- Classify a conjunction as true or false
- Use a truth table to analyze disjunctions

Help

DEFINED TERMS

DEFINED TERMS

disjunction	A statement formed by combining two statements with the word **or**.

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Question #1 True/False

Show Answer

A disjunction is a statement formed by combining two statements with the word and.

- True
- False

DISJUNCTIONS

Example:

p: Mr. Forbes lives in the town.
q: Mr. Smith lives in the country.
p v q: Mr. Forbes lives in the town or Mr. Smith lives in the country.

Notice, that for the disjunction to be true only one of the statements must be true. Another way to say this is that the only way a disjunction will be false is if both statements are false.

The following truth table illustrates disjunction.

Disjunction	
p	*q*	*p or q*
T	*T*	*T*
T	*F*	*T*
F	*T*	*T*
F	*F*	*F*

Notice that a disjunction is true when either one or both of its parts are true. It is false only when both parts are false.

Are the following disjunctions true or false?

Example 1:
- Grass is green or trees have branches.
- Since both statements are true, the disjunction is also true.

Example 2:
- George Washington was the first US President or 2 + 2 = 5.
- This is also true since the first statement is true. Remember, when testing the validity of disjunctions it is only necessary for one of the statements to be true.

Example 3:
- One point makes a line or 2 X 4 = 6
- Since both statements are false, the disjunction is also false.

We can also write disjunctions using symbols:

Example 4:
p: 2 X 4 = 10
q: Grass is green
Is **p v q** true or false?

Since **p** is false and **q** is true, the disjunction is true. Remember, if only one of the statements is true then the disjunction is also true.

Question #2 True/False

Show Answer

Answer Key Show

Select true or false to tell whether the following disjunction is true or false. Use the truth table if needed.
January is the first month of the year or December is the last month.

- True
- False

Question #3 True/False

Show Answer

Answer Key Show

Select true or false to tell whether the following disjunctions are true or false. Use the truth table if needed.
5 · 3 = 15 or 7 + 5 = 20

- True
- False

Question #4 True/False

Show Answer

Answer Key Show

Select true or false to tell whether the following disjunction is true or false. Use the truth table if needed.
A line has only one point or a plane has at least 3 points.

- True
- False

Question #5 True/False

Show Answer

Answer Key Show

Select true or false to tell whether the following disjunction is true or false. Use the truth table if needed.
George Washington was President of Mexico or Abe Lincoln was President of Spain.

- True
- False

Question #6 True/False

Show Answer

Answer Key Show

Select true or false to tell whether the following disjunction is true or false. Use the truth table if needed.
5 is less than 7 or 7 is less than 12.

- True
- False

Question #7 True/False

Show Answer

Answer Key Show

Select true or false to tell whether the following disjunction is true or false. Use the truth table if needed.
A segment has a midpoint or ray $\overleftrightarrow{AB}$ is the name of a ray.

- True
- False

Question #8 True/False

Show Answer

Answer Key Show

Select true or false to tell whether the following disjunction is true or false. Use the truth table if needed.
A line and a point outside the line are in exactly one plane or two planes intersect in a plane.

- True
- False

Question #9 True/False

Show Answer

Answer Key Show

Select true or false to tell whether the following disjunction is true or false. Use the truth table if needed.
Some roses are red or some violets are blue.

- True
- False

Question #10 True/False

Show Answer

Answer Key Show

Select true or false to tell whether the following disjunction is true or false. Use the truth table if needed.
Collinear means points on the same plane or coplanar means points on the same line.

- True
- False

Question #11 True/False

Show Answer

Answer Key Show

Select true or false to tell whether the following disjunction is true or false. Use the truth table if needed.
In this diagram, *RS* + *ST* = *SR* or *ST* + *RS* = *RT*.

- True
- False

Question #12 True/False

Show Answer

Answer Key Show

Use the following statements to determine if the disjunction is true or false.

p: 7 is an odd number

q: 3 is the square root of 9

Is p v q true or false?

- True
- False

Question #13 True/False

Show Answer

Answer Key Show

Use the following statements to determine if the disjunction is true or false.

p: 7 is an even number

q: 3 is the square root of 9

Is p v q true or false?

- True
- False

Question #14 True/False

Show Answer

Answer Key Show

Use the following statements to determine if the disjunction is true or false.

p: 7 is an even number

q: 3 is the square root of 10

Is p v q true or false?

- True
- False

Question #15 True/False

Show Answer

Answer Key Show

Use the following statements to determine if the disjunction is true or false.

p: The grass is green.

q: 3 is the square root of 10

Is p v q true or false?

- True
- False

Question #16 True/False

Show Answer

Answer Key Show

Use the following statements to determine if the disjunction is true or false.

p: The grass is green.

q: A rectangle has four sides.

Is p v q true or false?

- True
- False