

# PRINTABLE VERSION

## Quiz 1

You scored 100 out of 100

### Question 1

Your answer is CORRECT.

Which of the following, if any, is an example of a false statement?

- a) ☐ Sit down.
- b) ☒ There are exactly 12 people who live in Texas.
- c) ☐ There are students taking Discrete Math this semester.
- d) ☐ None of the above.

### Question 2

Your answer is CORRECT.

Consider the following sentence:

Stand up.

Of the options provided below, which one most accurately describes why this sentence is not a statement?

- a) ☐ The sentence is neither true nor false because there are one or more variables that can change its truth or falsity; it is an open sentence.
- b) ☒ The sentence is neither true nor false because it is a command.
- c) ☐ This sentence is not a statement because, if it were, it would be assigned values of both true *and* false!
- d) ☐ The sentence is neither true nor false because it is a question.

### Question 3

Your answer is CORRECT.

Consider the sentence

$$\sin(\theta + \pi) = 0$$

This is ...

- a) ☒ an open sentence.

b) ☐ a false statement.

c) ☐ a true statement.

#### Question 4

Your answer is CORRECT.

Of the options provided below, which pair  $P$ ,  $Q$  can be used to make the sentence  $P \vee Q$  true?

a) ☐  $P : \cos(\pi) = 0$  ,  $Q : \text{The function } e^x \text{ has horizontal tangent lines at some points}$

b) ☐  $P : 2^3 + 2^2 + 2^1 + 2^0 = 15$  ,  $Q : 6t = 12$

c) ☐  $P : \cos(\pi) = 0$  ,  $Q : 6t = 12$

d) ☒  $P : 2^3 + 2^2 + 2^1 + 2^0 = 15$  ,  $Q : \text{The function } e^x \text{ has horizontal tangent lines at some points}$

#### Question 5

Your answer is CORRECT.

Consider the statement  $P : 89 \text{ is odd}$ . Which, if any, of the following statements correctly expresses the negation  $\neg P$ ?

a) ☐ 89 is odd.

b) ☒ 89 is even.

c) ☐ None of the other statements correctly express  $\neg P$ .

d) ☐ 89 is neither even nor odd.

e) ☐ It is not true that 89 is even.

#### Question 6

Your answer is CORRECT.

Given a statement  $P$  when will the statement  $P \vee \neg P$  be true? (Hint: use a truth table)

a) ☐ When  $P$  is true this statement is false, and when  $P$  is false this statement is also false. That is, this statement is always false no matter the truth value of  $P$ .

b) ☒ When  $P$  is true this statement is true, and when  $P$  is false this statement is also true. That is, this statement is always true no matter the truth value of  $P$ .

c) ☐ None of the above.

### Question 7

Your answer is CORRECT.

This question is about prime numbers. If you are unfamiliar with this concept, you might want to ask your instructor! Consider the statement  $P$  below:

$P : 31$  is a prime number.

Which, if any, of the following explains the truth value of  $\neg P$  ?

- a) ☐  $\neg P$  is true because 31 is divisible by 2.
- b) ☒  $\neg P$  is false because 31 is only divisible by 1 and 31.
- c) ☐  $\neg P$  is true because 31 is divisible by 11
- d) ☐  $\neg P$  is true because 31 is divisible by  $3^2$ .

### Question 8

Your answer is CORRECT.

Suppose the following conditional statement is false:

$$(e > 3) \Rightarrow Q$$

Which, if any, of the following sentences can be used for  $Q$ ?

- a) ☐  $Q : \int_0^1 t^2 dt = 1/3$
- b) ☒ No sentence for  $Q$  will make the conditional false. This is because the premise or hypothesis is false, and so the entire conditional is always true.
- c) ☐  $Q : \lim_{t \rightarrow \infty} \frac{1}{t} = 0$
- d) ☐  $Q : 3$  is even
- e) ☐  $Q : 2 \leq 3$

### Question 9

Your answer is CORRECT.

A biconditional statement  $P \Leftrightarrow Q$  is true when

- a) ☒  $P$  and  $Q$  have the same truth value

b) ☐ P and Q have opposite truth values

c) ☐ None of the above.

#### Question 10

Your answer is CORRECT.

Suppose we are told that the statement  $P \Leftrightarrow (\tan^2(\pi/6) + 1 = \sec^2(\pi/6))$  is false. Which, if any, of the following sentences can be used for P ?

a) ☐ P : the absolute value function is continuous

b) ☒ P :  $\ln(0) = 3$

c) ☐ P(x) :  $x \geq 2$

d) ☐ None of the above.