

PRINTABLE VERSION

Quiz 1

You scored 80 out of 100

Question 1

Your answer is CORRECT.

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

- a) ☐ There are exactly 12 people who live in Texas.
- b) ☒ Sit down.
- 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 it is a question.
- 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 there are one or more variables that can change its truth or falsity; it is an open sentence.

Question 3

Your answer is CORRECT.

Consider the sentence

$$\sin(x) = 0$$

This is ...

- a) ☐ a false statement.
- b) ☒ an open sentence.
- c) ☐ a true statement.

Question 4

Your answer is INCORRECT.

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

- a) ☐ $P : 2^3 + 2^2 + 2^1 + 2^0 = 15$, $Q : \cos(3\pi) = -1$
- b) ☐ $P : 2^3 + 2^2 + 2^1 + 2^0 = 15$, $Q : 6t = 12$
- c) ☒ $P : \lim_{t \rightarrow 0} \frac{\sin t}{t} = 0$, $Q : 6t = 12$
- d) ☐ $P : \lim_{t \rightarrow 0} \frac{\sin t}{t} = 0$, $Q : \cos(3\pi) = -1$

Question 5

Your answer is CORRECT.

Consider the statement $P : -74$ is *odd* . Which, if any, of the following statements correctly expresses the negation $\neg P$?

- a) ☒ None of the other statements correctly express $\neg P$.
- b) ☐ -74 is both even and odd.
- c) ☐ It is not true that -74 is even.
- d) ☐ -74 is neither even nor odd.
- e) ☐ -74 is odd.

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 : 10 is a prime number.

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

- a) ☐ $\neg P$ is true because 10 is divisible by 3^2 .
- b) ☐ $\neg P$ is true because 10 is divisible by 11
- c) ☐ $\neg P$ is false because 10 is only divisible by 1 and 10.
- d) ☒ $\neg P$ is true because 10 is divisible by 2.

Question 8

Your answer is CORRECT.

Suppose the following conditional statement is false:

$$\left(\frac{1}{2} + \frac{3}{5} = \frac{13}{10}\right) \Rightarrow Q$$

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

- a) ☒ 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.

b) ☐ $Q : 2 \leq 3$

c) ☐ $Q : 3$ is even

d) ☐ $Q : \lim_{t \rightarrow \infty} \frac{1}{t} = 0$

e) ☐ $Q : \int_0^1 t^2 dt = 1/3$

Question 9

Your answer is **INCORRECT**.

A biconditional statement $P \iff Q$ is false when

a) ☐ P and Q have opposite truth values

b) ☒ P and Q have the same truth value

c) ☐ None of the above.

Question 10

Your answer is **CORRECT**.

Suppose we are told that the statement $P \iff (\tan^2(\pi/6) + 1 = \sec^2(\pi/6))$ 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.