**1.**

award:
**2.60 out of
2.60 points**

Which of the following is true for the statement "Do not pass go"?

- ○ This is a proposition that is true.
- ○ This is a proposition that is false.
- ✓◉ This is not a proposition; it's a command.
- ○ This is not a proposition; it's a question.

All the declarative sentences are propositions that are either true or false, but not both.

**2.**

award:
**2.60 out of
2.60 points**

"What time is it ?" is a proposition.

- ○ Yes
- ✓◉ No

All the declarative sentences are propositions that are either true or false, but not both.

**3.**

award:
**2.60 out of
2.60 points**

Which of the following statements are true about the sentence "There are no black flies in Maine"?

- ✓☑ This is a proposition.
- ✓☐ This is not a proposition.
- ✓☑ It's truth value is false, as anyone who has been to Maine knows.
- ✓☐ It's truth value is true, as anyone who has been to Maine doesn't know.
- ✓☐ It has no truth value.

All the declarative sentences are propositions that are either true or false, but not both.

**4.**

award:
**2.60 out of
2.60 points**

"4 + $x$ = 5" is a proposition, because it is a declarative sentence.

○ True

✅◉ False

Any equation can't be a declarative sentence and its truth value depends on the value of the unknown variable $x$.

**5.**

award:
**2.60 out of
2.60 points**

Identify the true statement about the sentence "The moon is made of green cheese."

✅◉ This is a proposition that is false.

○ This is a proposition that is true.

○ This is not a proposition with no truth value.

○ This is not a proposition; it's a command.

All the declarative sentences are propositions that are either true or false, but not both.

**6.**

award:
**2.60 out of
2.60 points**

Identify the correct statements about "$2n \geq 100$."

✅☐ This is a proposition.

✅☑ This is not a proposition.

✅☑ Its truth value depends on the value of $n$.

✅☐ Its truth value depends on the value of $2n$.

All the declarative sentences are propositions that are either true or false, but not both.

| **Check All That Apply** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**7.**

award:
**2.60 out of
2.60 points**

Let $p$ and $q$ be the propositions
$p$ :You have the flu.
$q$ :You miss the final examination.
Identify the English sentence that expresses the compound proposition $p \rightarrow q$.

○ If you have the flu, then you will not miss the final exam.

○ If you miss the final exam then you have the flu.

○ If you don't have the flu, then you miss the final exam.

✅◉ If you have the flu, then you miss the final exam.

The compound proposition $p \rightarrow q$ of the hypothesis $p$ and the conclusion $q$ is translated in English as "if $p$, then $q$."

| **Multiple Choice** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**8.**

Let $q$ and $r$ be the propositions
$q$ :You miss the final examination.
$r$ :You pass the course.
The English sentence of the compound proposition $\neg q \leftrightarrow r$ is "You do not miss the final exam if and only if you pass the course."

⊘ Yes

❌⊙ No

Let $q$ and $r$ be propositions. The biconditional statement $q \leftrightarrow r$ is the proposition "$q$ if and only if $r$" and the $\neg q$ is the opposite of itself.

| Yes / No | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
| --- | --- | --- |

**9.**

Let $q$ and $r$ be the propositions
$q$ :You miss the final examination.
$r$ :You pass the course.
The English statement for the compound proposition $q \rightarrow \neg r$ is "If you miss the final exam, then you pass the course."

⊘ True

✓⊙ False

The compound proposition $q \rightarrow r$ of the hypothesis $q$ and the conclusion $r$ is translated in English as "if $q$, then $r$" and the $\neg r$ is opposite of itself.

| True / False | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
| --- | --- | --- |

**10.**

Let $p$, $q$, and $r$ be the propositions
$p$ :You have the flu.
$q$ :You miss the final examination.
$r$ :You pass the course.
Identify the statement that express the compound proposition $p \lor q \lor r$ as an English sentence.

⊘ You have the flu, and miss the final exam, and pass the course.

⊘ You have the flu, or miss the final exam, or do not pass the course.

⊘ You have the flu, and miss the final exam, and do not pass the course.

✓⊙ You have the flu, or miss the final exam, or pass the course.

The English statement for the given compound statement is $p \lor q \lor r$ is "$p$, or $q$, or $r$."

| Multiple Choice | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
| --- | --- | --- |

**11.**

Let $p$, $q$, and $r$ be the propositions
$p$ :You have the flu.
$q$ :You miss the final examination.
$r$ :You pass the course.
Identify the English sentence of the compound proposition $(p \rightarrow \neg r) \vee (q \rightarrow \neg r)$.

- ✓⦿ If you have the flu then you will not pass the course, or if you miss the final exam then you will not pass the course.

- ◯ If you have the flu then you will pass the course, and if you miss the final exam then you will pass the course.

- ◯ If you have the flu then you will not pass the course, and if you miss the final exam then you will not pass the course.

- ◯ If you have the flu then you will pass the course, or if you miss the final exam then you will pass the course.

The compound proposition $p \rightarrow q$ of the hypothesis $p$ and the conclusion $q$ is translated in English as "if $p$, then $q$"and the ¬q implies the opposite of itself.

| Multiple Choice | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**12.**

Let $p$, $q$, and $r$ be the propositions
$p$ :You have the flu.
$q$ :You miss the final examination.
$r$ :You pass the course.
The English sentence of the compound proposition $(p \ q) \ (\neg q \ r)$ is "Either you have the flu and miss the final exam, or you do not miss the final exam and do pass the course."

- ✓⦿ Yes

- ◯ No

**13.**

Match the named related conditionals (in the left column) to their corresponding statements (in the right column) of the conditional statement "If it snows today, I will ski tomorrow."

1.
Converse
　　　　I will ski tomorrow only if it snows today. [1 ▼] ✓

2.
Contrapositive
　　　　If it does not snow today, then I will not ski tomorrow. [3 ▼] ✓

3.
Inverse
　　　　If I don't ski tomorrow, then it will not have snowed today. [2 ▼] ✓
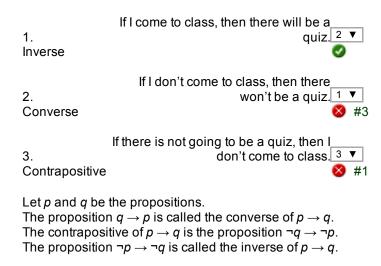
Let $p$ and $q$ be propositions.
The proposition $q \rightarrow p$ is called the converse of $p \rightarrow q$.
The contrapositive of $p \rightarrow q$ is the proposition $\neg q \rightarrow \neg p$.
The proposition $\neg p \rightarrow \neg q$ is called the inverse of $p \rightarrow q$.

| Matching | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**14.**

Match the named related conditionals (in the left column) to their corresponding statements (in the right column) of the conditional statement "I come to class whenever there is going to be a quiz."

1.
Inverse

If I come to class, then there will be a quiz. 2 ▼ ✓

2.
Converse

If I don't come to class, then there won't be a quiz. 1 ▼ ✗ #3

3.
Contrapositive

If there is not going to be a quiz, then I don't come to class. 3 ▼ ✗ #1

Let $p$ and $q$ be the propositions.
The proposition $q \rightarrow p$ is called the converse of $p \rightarrow q$.
The contrapositive of $p \rightarrow q$ is the proposition $\neg q \rightarrow \neg p$.
The proposition $\neg p \rightarrow \neg q$ is called the inverse of $p \rightarrow q$.

**15.**

Match the named related conditionals (in the left column) to their corresponding statements (in the right column) of the conditional statement "A positive integer is a prime only if it has no divisors other than 1 and itself."

1.
Inverse

If a positive integer is not prime, then it has a divisor other than 1 and itself. 1 ▼ ✓

2.
Contrapositive

If a positive integer has a divisor other than 1 and itself, then it is not prime. 2 ▼ ✓

3.
Converse

A positive integer is a prime if it has no divisors other than 1 and itself. 3 ▼ ✓

Let $p$ and $q$ be the propositions.
The proposition $q \rightarrow p$ is called the converse of $p \rightarrow q$.
The contrapositive of $p \rightarrow q$ is the proposition $\neg q \rightarrow \neg p$.
The proposition $\neg p \rightarrow \neg q$ is called the inverse of $p \rightarrow q$.

**16.**

Identify the correct statements about "$2^n \geq 100$."

- ✓☐ This is a proposition.
- ✓☑ This is not a proposition.
- ✓☑ Its truth value depends on the value of $n$.
- ✓☐ Its truth value depends on the value of $2^n$.

All the declarative sentences are propositions that are either true or false, but not both.

| Check All That Apply | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**17.**

The negation of the proposition "Mei has an MP3 player" is_____.

- ✓ ☐ It is not the case that Mei has no MP3 player.
- ✓ ☑ It is not the case that Mei has MP3 player.
- ✗→☐ Mei has no MP3 player.
- ✓ ☐ Mei has more than one MP3 player.
- ✓ ☐ Mei has no CD player.

The propositions that mean "Mei has no MP3 player" are correct.

| Check All That Apply | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**18.**

Let $P(x)$: There is no pollution in New Jersey.
The statement "The whole world is polluted" is the negation of $P(x)$.
Is the above statement true?

- ✗◉ Yes
- ☐ No

Either "New Jersey is polluted", "There is pollution in New Jersey" or "It is not the case that there is no pollution in New Jersey" are the negation of $P(x)$.

| Yes / No | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**19.**

If $P(x)$: 2 + 1 = 3, then the negation of $P(x)$ is 2 × 1 ≠ 3.

○ True

✓◉ False

The proposition 2 × 1 ≠ 3 is true, but it is not the negation of $P(x)$. The negation of $P(x)$: 2 + 1 = 3, is "2 + 1 ≠ 3".

| **True / False** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**20.**

Let $p$ and $q$ be the propositions
$p$: "Swimming at the New Jersey shore is allowed."
$q$: "Sharks have been spotted near the shore."
Check if the proposition, "No sharks have been spotted near the shore" is the expression for $\neg q$.

✓◉ True

○ False

"Sharks have not been spotted near the shore" is one of the expression for $\neg q$.

| **True / False** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**21.**

Let $p$ and $q$ be the propositions "Swimming at the New Jersey shore is allowed" and "Sharks have been spotted near the shore," respectively. Identify the compound proposition $p \wedge q$.

○ Either swimming at the New Jersey shore is allowed or no sharks have been spotted near the shore.

○ Swimming at the New Jersey shore is not allowed, and sharks have not been spotted near the shore.

○ Either swimming at the New Jersey shore is not allowed or sharks have been spotted near the shore.

✓◉ Swimming at the New Jersey shore is allowed, and sharks have been spotted near the shore.

| **Multiple Choice** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

## 22.

Let *p* and *q* be the propositions "Swimming at the New Jersey shore is allowed" and "Sharks have been spotted near the shore," respectively. Identify the compound proposition $\neg p \lor q$ as an English sentence.

○ Swimming at the New Jersey shore is not allowed, and sharks have been spotted near the shore.

○ Swimming at the New Jersey shore is allowed, or sharks have not been spotted near the shore.

✓◉ Swimming at the New Jersey shore is not allowed, or sharks have been spotted near the shore.

○ Swimming at the New Jersey shore is not allowed, and sharks have not been spotted near the shore.

The negation of *p* is "Swimming at the New Jersey shore is not allowed."

| **Multiple Choice** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

## 23.

Let *p* and *q* be the propositions "Swimming at the New Jersey shore is allowed" and "Sharks have been spotted near the shore," respectively.
Is the compound proposition $p \rightarrow \neg q$: "If swimming at the New Jersey shore is not allowed, then sharks have been spotted near the shore" true?

✗◉ Yes

○ No

The given statement refers to the compound proposition $\neg p \rightarrow q$.

| **Yes / No** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

## 24.

Let *p* and *q* be the propositions "Swimming at the New Jersey shore is allowed" and "Sharks have been spotted near the shore," then the compound proposition $\neg p \rightarrow \neg q$ is "If sharks have not been spotted near the shore, then swimming at the New Jersey shore is not allowed."

✗◉ True

○ False

The compound proposition in the statement represents $\neg q \rightarrow \neg p$.

| **True / False** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**25.**

Let *p* and *q* be the propositions "Swimming at the New Jersey shore is allowed" and "Sharks have been spotted near the shore," respectively. The compound proposition $p \leftrightarrow \neg q$ is "Swimming at the New Jersey shore is allowed if and only if sharks _____ spotted near the shore."

| have not been | ✓ |

| **Fill in the Blank** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |

---

**26.**

Let *p* and *q* be the propositions
*p*: "Swimming at the New Jersey shore is allowed."
*q*: "Sharks have been spotted near the shore."
The compound proposition $\neg p \wedge (p \vee \neg q)$ is "Swimming at the New Jersey shore is __A__, __B__ either swimming at the New Jersey shore is __C__ __D__ sharks have not been spotted near the shore."
Match the following letters with their corresponding answers to be filled in the blanks.

1.                         not allowed
A                              [ 1 ▼ ] ✓

2.                         and
B                              [ 2 ▼ ] ✓

3.                         allowed
D                              [ 4 ▼ ] ✓

4.                         or
C                              [ 3 ▼ ] ✓

The compound proposition $p \vee \neg q$ is "either swimming at the New Jersey shore is allowed or sharks have not been spotted near the shore".

| **Matching** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |

---

**27.**

Let *p* and *q* be the propositions
*p* : It is below freezing.
*q* : It is snowing.
The compound proposition for the statement "It is below freezing and snowing" is $p \wedge q$.

✓ ◉ True

○ False

| **True / False** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |

**28.**

award:
**0.87 out of
2.60 points**

Let $p$ and $q$ be the propositions
$p$ : It is below freezing.
$q$ : It is snowing.
Identify the correct steps that are used to find the compound proposition for the statement "It is not below freezing and it is not snowing."

- ✓ ☑ The proposition for the statement "It is not below freezing" is $\neg p$.
- ✗ ☑ The proposition for the statement "It is below freezing" is $p$.
- ✓ ☑ The proposition for the statement "It is not snowing" is $\neg q$.
- ✓ ☑ The proposition for the statement "It is not below freezing and it is not snowing" is $\neg p \wedge \neg q$.
- ✓ ☐ The proposition for the statement "It is not below freezing and it is not snowing" is $\neg p \vee \neg q$.
- ✗ ☑ The proposition for the statement "It is below freezing and it is not snowing" is $p \wedge \neg q$.

"It is not below freezing" is the negation of $p$, and "It is not snowing" is the negation of $q$.

| **Check All That Apply** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**29.**

award:
**2.60 out of
2.60 points**

Let $p$ and $q$ be the propositions
$p$: It is below freezing.
$q$: It is snowing.
The compound proposition for the statement "It is either snowing or below freezing (or both)" is $p \wedge q$.

- ○ True
- ✓ ◉ False

The compound proposition is $p \vee q$.

| **True / False** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**30.**

award:
**2.60 out of
2.60 points**

Let $p$ and $q$ be the propositions "It is below freezing" and "It is snowing" respectively. Is the compound proposition, $q \rightarrow p$: "If it is below freezing, it is also snowing," is false?

- ✓ ◉ Yes
- ○ No

Here, the hypothesis $p$ and the conclusion $q$ are interchanged in the compound proposition. Hence, the statement is false.

| **Yes / No** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**31.**

award:
**2.60 out of
2.60 points**

Let $p$ and $q$ be the propositions "It is below freezing" and "It is snowing" respectively.
Identify the steps that are used to find the compound proposition for the statement "Either it is below freezing or it is snowing, but it is not snowing if it is below freezing."

✓ ☑ The proposition for the statement "Either it is below freezing or it is snowing" is $p \lor q$.

✓ ☐ The proposition for the statement "Either it is below freezing or it is snowing" is $p \land q$.

✓ ☐ The compound proposition for the statement "It is not snowing if it is below freezing" is $\neg q \to p$.

✓ ☐ The compound proposition for the statement "It is snowing if it is below freezing" is $q \to p$.

✓ ☑ The compound proposition for the statement "Either it is below freezing or it is snowing, but it is not snowing if it is below freezing" is $(p \lor q) \land (p \to \neg q)$.

| Check All That Apply | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**32.**

award:
**2.60 out of
2.60 points**

The truth value of the biconditional statement "1 + 1 = 2 if and only if 2 + 3 = 4" is true.

○ Yes

✓ ◉ No

This is **T ↔ F**, which is false.

| Yes / No | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**33.**

award:
**2.60 out of
2.60 points**

Identify the correct statement about the truth value of the proposition "1 + 1 = 3 if and only if monkeys can fly."

○ The truth value is false because the first statement is true and the second statement is false.

○ The truth value is true because the first statement is true and the second statement is false.

✓ ◉ The truth value is true because both statements are false.

○ The truth value is true because the first statement is false and the second statement is true.

○ The truth value is false because the first statement is false and the second statement is true.

This is **F ↔ F**, which is true.

| Multiple Choice | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**34.**

award:
**2.60 out of
2.60 points**

Identify the truth value of the proposition "0 > 1 if and only if 2 > 1."

- ○ True
- ✅◉ False

This is **F ↔ T**, which is false.

| **True / False** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**35.**

award:
**0 out of
2.60 points**

Identify the truth value of the proposition "If 1 + 1 = 3, then unicorns exist."

- ○ True
- ❌◉ False

This is **F → F**, which is true.

| **True / False** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**36.**

award:
**0 out of
2.60 points**

Identify the correct statement about the truth value of the proposition "If 1 + 1 = 2, then dogs can fly."

- ❌◉ The truth value is true because the first statement is true and the second statement is false.
- ○ The truth value is false because the first statement is false and the second statement is true.
- ○ The truth value is true because the first statement is false and the second statement is true.
- ○ The truth value is true because both statements are false.
- →○ The truth value is false because the first statement is true and the second statement is false.

This is **T → F**, which is false.

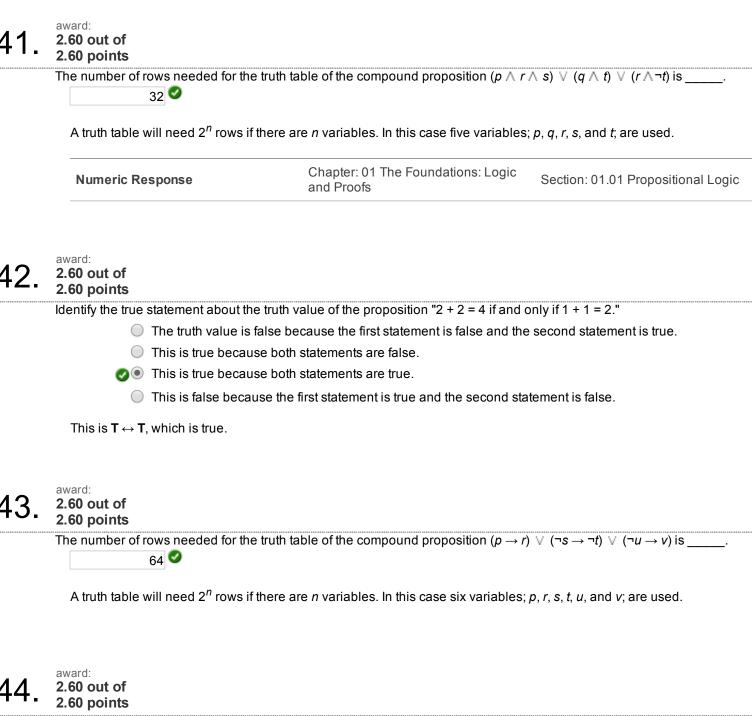| **Multiple Choice** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**37.**

award:
**2.60 out of
2.60 points**

Determine whether the "or" in the given statement is an inclusive "or" or an exclusive "or":

Lunch includes soup or salad.

- ⚪ inclusive "or"
- ✅⦿ exclusive "or"

The restaurant would probably charge extra if the diner wanted both of these items, so this is an exclusive "or".

| **Multiple Choice** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**38.**

award:
**0 out of
2.60 points**

Determine whether the "or" in the given statement is an inclusive "or" or an exclusive "or":

Publish or perish.

- →⚪ inclusive "or"
- ❌⦿ exclusive "or"

This phrase means that faculty members who do not publish papers in research journals are likely to be fired from their jobs during the probationary period. Hence this is an inclusive "or".

| **Multiple Choice** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**39.**

award:
**2.60 out of
2.60 points**

The number of rows needed for the truth table of the compound proposition $(q \rightarrow \neg p) \lor (\neg p \rightarrow \neg q)$ is _____.

4 ✅

A truth table will need $2^n$ rows if there are $n$ variables. In this case 2 variables, $p$ and $q$, are used.

| **Numeric Response** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**40.**

award:
**2.60 out of
2.60 points**

What is the number of rows needed for the truth table of the compound proposition $(p \lor \neg t) \land (p \lor \neg s)$?

8 ✅

A truth table will need $2^n$ rows if there are $n$ variables. In this case three variables; $p$, $t$, and $s$; are used.

| **Numeric Response** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
|---|---|---|

**41.**

award:
**2.60 out of
2.60 points**

The number of rows needed for the truth table of the compound proposition $(p \land r \land s) \lor (q \land t) \lor (r \land \neg t)$ is _____.

32 ✓

A truth table will need $2^n$ rows if there are $n$ variables. In this case five variables; $p$, $q$, $r$, $s$, and $t$; are used.

| Numeric Response | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.01 Propositional Logic |
| --- | --- | --- |

**42.**

award:
**2.60 out of
2.60 points**

Identify the true statement about the truth value of the proposition "2 + 2 = 4 if and only if 1 + 1 = 2."

○ The truth value is false because the first statement is false and the second statement is true.

○ This is true because both statements are false.

✓ ◉ This is true because both statements are true.

○ This is false because the first statement is true and the second statement is false.

This is **T** ↔ **T**, which is true.

**43.**

award:
**2.60 out of
2.60 points**

The number of rows needed for the truth table of the compound proposition $(p \rightarrow r) \lor (\neg s \rightarrow \neg t) \lor (\neg u \rightarrow v)$ is _____.

64 ✓

A truth table will need $2^n$ rows if there are $n$ variables. In this case six variables; $p$, $r$, $s$, $t$, $u$, and $v$; are used.

**44.**

award:
**2.60 out of
2.60 points**

Identify the correct statement about the truth values of the proposition "If 1 + 1 = 3, then dogs can fly."

✓ ◉ The truth value is true because both statements are false.

○ The truth value is false because both statements are false.

○ The truth value is true because the first statement is false and the second statement is true.

○ The truth value is true because both statements are true.

○ The truth value is false because the first statement is false and the second statement is true.

This is **F** → **F**, which is true.

**45.**

Let $P(x)$: The summer in Maine is hot and sunny. The negation of $P(x)$: _____.

- ○ The summer in Maine is not hot but sunny.
- ○ It is not the case that the summer in Maine is not hot or it is not sunny.
- ✓◉ The summer in Maine is not hot or it is not sunny.
- ○ The summer in Maine is hot but not sunny.

The negation of the statement should specify that the summer in Maine is neither hot nor sunny.

Consider the statement, "Whenever the system software is being upgraded, users cannot access the file system. If users can access the file system, then they can save new files. If users cannot save new files, then the system software is not being upgraded."
Let the statement be symbolically represented as:
$u$: "The software system is being upgraded."
$a$: "Users can access the file system."
$s$: "Users can save new files."

| Section Break | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.02 Applications of Propositional Logic |
|---|---|---|

**46.**

What is the symbolic representation of the statement, "Whenever the system software is being upgraded, users cannot access the file system."?

- ○ $u \rightarrow a$
- ✓◉ $u \rightarrow \neg a$
- ○ $u \leftrightarrow \neg a$
- ○ $u \leftrightarrow a$

The symbolic representation of the statement, "Whenever the system software is being upgraded, users cannot access the file system." is $u \rightarrow \neg a$.

| Multiple Choice | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.02 Applications of Propositional Logic |
|---|---|---|

**47.**

What is the symbolic representation of the statement, "If users can access the file system, then they can save new files."?

- ✅◉ $a \rightarrow s$
- ◯ $a \wedge s$
- ◯ $a \leftrightarrow s$
- ◯ $s \rightarrow a$

The symbolic representation of the statement, "If users can access the file system, then they can save new files." is $a \rightarrow s$.

| Multiple Choice | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.02 Applications of Propositional Logic |
|---|---|---|

**48.**

What is the symbolic representation of the statement, "If users cannot save new files, then the system software is not being upgraded."?

- ◯ $\neg s \rightarrow u$
- ◯ $u \rightarrow \neg s$
- ✅◉ $\neg s \rightarrow \neg u$
- ◯ $\neg u \rightarrow \neg s$

The symbolic representation of the statement, "If users cannot save new files, then the system software is not being upgraded." is $\neg s \rightarrow \neg u$.

| Multiple Choice | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.02 Applications of Propositional Logic |
|---|---|---|

**49.**

Is the given system consistent?

- ✅◉ Yes
- ◯ No

We can make all the conclusions true by making *a* false, *s* true, and *u* false. Therefore if the users cannot access the file system, they can save new files, and the system is not being upgraded, then all the conditional statements are true. Thus the system is consistent.

| Yes / No | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.02 Applications of Propositional Logic |
|---|---|---|

In context of the inhabitants of the island of knights and knaves created by Smullyan, where knights always tell the truth and knaves always lie. You encounter two people, A and B. Determine what A and B are if they address you as:
A says "The two of us are both knights" and B says "A is a knave."

- ○ Both A and B are knights.
- ○ Both A and B are knaves.
- ○ A is a knight and B is a knave.
- ✓ ◉ A is a knave and B is a knight.

If A is a knight, then his statement that both of them are knights is true, and both will be telling the truth. But that is impossible, because B is asserting otherwise (that A is a knave). If A is a knave, then B's assertion is true, so he must be a knight, and A's assertion is false, as it should be. Thus we conclude that A is a knave and B is a knight.

| **Multiple Choice** | Chapter: 01 The Foundations: Logic and Proofs | Section: 01.02 Applications of Propositional Logic |
| --- | --- | --- |