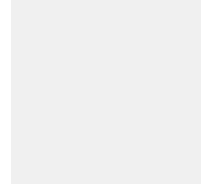


Question 1

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Which compound proposition is True when $p = q = r = F$, and is False otherwise?

Select one:

- ☒ a. $\neg p \wedge \neg q \wedge \neg r$
- ☐ b. $p \vee q \vee \neg r$
- ☐ c. $p \wedge q \wedge \neg r$
- ☐ d. $p \wedge \neg q \wedge \neg r$
- ☐ e. $p \wedge \neg q \wedge r$

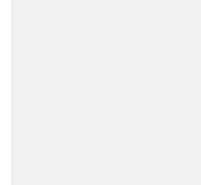
Feedback

The correct answer is: $\neg p \wedge \neg q \wedge \neg r$

Question 2

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let p , q and r be propositions:

p : You go to class regularly

q : You do all homework problems

r : You receive good grades

Translate the sentence into logical expression:

"If you go to class regularly and do all homework problems you will receive good grades".

Select one:

- ☐ a. $r \rightarrow (p \wedge q)$
☐ b. $(p \vee q) \rightarrow r$
☐ c. $(p \vee q) \leftrightarrow r$
☒ d. $(p \wedge q) \rightarrow r$

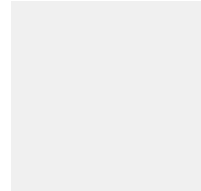
Feedback

The correct answer is: $(p \wedge q) \rightarrow r$

Question 3

Complete

Mark 0.33 out of 1.00



Flag question

Question text

Let p, q be two propositions. Which propositions are logically equivalent to $p \leftrightarrow q$?

$(p \wedge q) \vee (\neg p \vee \neg q)$ Answer 1
 $(p \vee q) \wedge (\neg p \vee \neg q)$ Answer 2
 $(p \vee q) \oplus (\neg p \vee \neg q)$ Answer 3

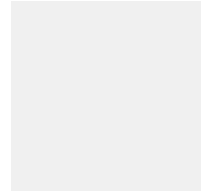
Feedback

The correct answer is: $(p \wedge q) \vee (\neg p \vee \neg q) \rightarrow$ No, $(p \vee q) \wedge (\neg p \vee \neg q) \rightarrow$ No, $(p \vee q) \oplus (\neg p \vee \neg q) \rightarrow$ Yes

Question 4

Complete

Mark 0.50 out of 1.00



Flag question

Question text

Let p, q be two propositions. Which propositions are logically equivalent to $p \rightarrow q$?

$\neg q \rightarrow p$ Answer 1

$\neg p \rightarrow \neg q$ Answer 2

$\neg q \rightarrow \neg p$ Answer 3

$\neg p \rightarrow q$ Answer 4

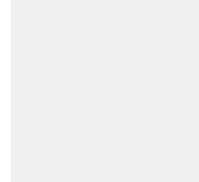
Feedback

The correct answer is: $\neg q \rightarrow p \rightarrow$ No, $\neg p \rightarrow \neg q \rightarrow$ No, $\neg q \rightarrow \neg p \rightarrow$ Yes, $\neg p \rightarrow q \rightarrow$ No

Question 5

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $P(x)$ be a propositional function with domain $\{-1, 0, 1\}$

Which proposition on the left has the same truth value as the proposition on the right?

$\forall x P(x)$ Answer 1

$\exists x P(x) \wedge \forall x ((x \neq 0) \rightarrow \neg P(x))$ Answer 2

$\forall x ((x \neq 0) \rightarrow P(x)) \wedge \exists x \neg P(x)$ Answer 3

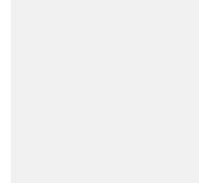
Feedback

The correct answer is: $\forall x P(x) \rightarrow$ P(-1)^P(0)^P(1), $\exists x P(x) \wedge \forall x ((x \neq 0) \rightarrow \neg P(x)) \rightarrow$ ¬P(-1)^P(0)^¬P(1), $\forall x ((x \neq 0) \rightarrow P(x)) \wedge \exists x \neg P(x) \rightarrow$ P(-1)^¬P(0)^P(1)

Question 6

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let:

$P(x)$ = "x is 20 minutes late in the final exam"

$Q(x)$ = "x is absent for more than 20% of lectures"

$R(x)$ = "x is not eligible to take the final exam"

Translate the sentence into logical expression, domain is the set of all students in class

"Students who are not eligible to take final exams are those who is absent for more than 20% of lectures or is 20 minutes late in the final exam"

Select one:

- ☐ a. $\forall x((Q(x) \wedge P(x)) \rightarrow R(x))$
- ☐ b. None of the other choices is correct
- ☐ c. $\forall x(R(x) \rightarrow (Q(x) \wedge P(x)))$
- ☐ d. $\forall x(R(x) \leftrightarrow (Q(x) \wedge P(x)))$
- ☒ e. $\forall x(R(x) \leftrightarrow (Q(x) \vee P(x)))$

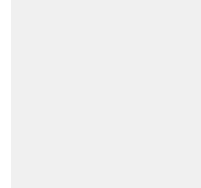
Feedback

The correct answer is: $\forall x(R(x) \leftrightarrow (Q(x) \vee P(x)))$

Question 7

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Given the hypotheses:

- I work hard or I am smart
- I am not smart
- If I work hard I will pass the exam
- If I am not lucky then I will not pass the exam.

Which conclusion can be drawn?

Select one:

- ☐ a. I work hard and I passed the exam and I am lucky
- ☒ b. I work hard and I passed the exam
- ☐ c. I work hard and I am lucky
- ☐ d. None of the other choices is correct

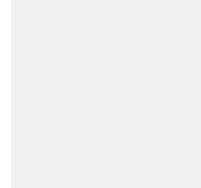
Feedback

The correct answer is: I work hard and I passed the exam and I am lucky

Question 8

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Find the negation of

$$\forall x \forall y (\exists z T(x, y, z) \wedge Q(x, y))$$

Select one:

- ☐ a. $\forall x \exists y (\forall z \neg T(x, y, z) \wedge \neg Q(x, y))$.
- ☐ b. $\forall x \exists y (\forall z T(x, y, z) \vee Q(x, y))$.
- ☒ c. $\exists x \exists y (\forall z \neg T(x, y, z) \vee \neg Q(x, y))$.
- ☐ d. $\exists x \exists y (\forall z \neg T(x, y, z) \vee Q(x, y))$.

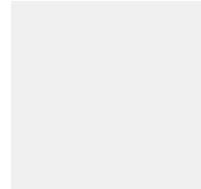
Feedback

The correct answer is: $\exists x \exists y (\forall z \neg T(x, y, z) \vee \neg Q(x, y))$.

Question 9

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Let A, B be sets. Which statements do NOT imply that A = B?

Select one:

- ☒ a. $A \cup B = \emptyset$
- ☐ b. $A \oplus B = \emptyset$
- ☐ c. $A \cap B = \emptyset$

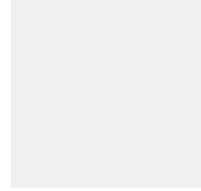
Feedback

The correct answer is: $A \cap B = \emptyset$

Question 10

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Find the cardinality of the set $P(\{\emptyset, a, \{a, \{a\}\}\})$

Answer:

2

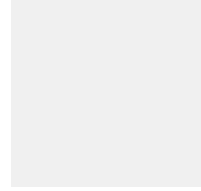
Feedback

The correct answer is: 8

Question 11

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\lfloor \left(\frac{7}{2}\right)^2 \rfloor - \left(\lfloor \frac{7}{2} \rfloor\right)^2$

Answer:

3

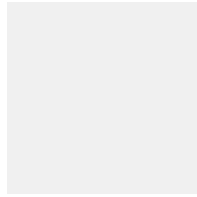
Feedback

The correct answer is: 3

Question 12

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $f \circ g(X) = aX + b$. Find $a + b$.

Answer:

39

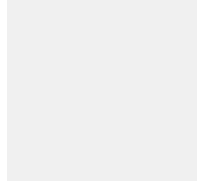
Feedback

The correct answer is: 39

Question 13

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\left\lfloor \frac{3}{2} - \left\lceil 3 + \frac{5}{4} \right\rceil \right\rfloor$

Answer:

-4

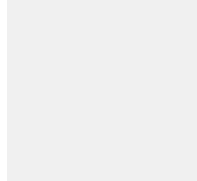
Feedback

The correct answer is: -4

Question 14

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f: \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$, $f(m, n) = n+1$. Choose correct answer:

Select one:



a. f is one-to-one but not onto

- ☐ b. $f(x)$ is neither one-to-one nor onto
- ☐ c. f is a bijection
- ☒ d. f is onto but not one-to-one

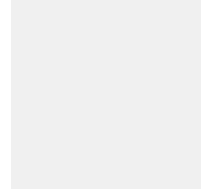
Feedback

The correct answer is: f is onto but not one-to-one

Question 15

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\sum_{j=0}^3 \sum_{i=0}^2 (i+j)$

Select one:

- ☐ a. 18
- ☐ b. 20
- ☐ c. 24
- ☐ d. Lựa chọn khác
- ☒ e. 30

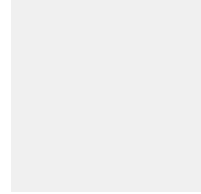
Feedback

The correct answer is: 30

Question 1

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Find

$$(11010 \wedge 10011) \oplus 01000$$

Answer:

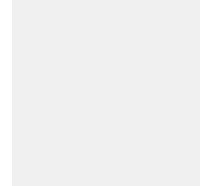
Feedback

The correct answer is: 11010

Question 2

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Given two propositions:

p = "I visit Hanoi."

q = "I visit Ho Chi Minh mausoleum"

Which sentence on the left corresponds to the expression on the right?

I visit Ho Chi Minh mausoleum only if I go to Hanoi.

Answer 1

I went to Hanoi, but I did not visit Ho Chi Minh mausoleum.

Answer 2

I cannot visit Ho Chi Minh mausoleum if I do not go to Hanoi

Answer 3

Whenever I go to Hanoi, I visit Ho Chi Minh mausoleum.

Answer 4

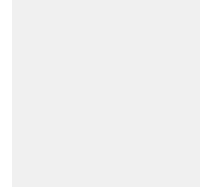
Feedback

The correct answer is: I visit Ho Chi Minh mausoleum only if I go to Hanoi. $\rightarrow q \rightarrow p$, I went to Hanoi, but I did not visit Ho Chi Minh mausoleum. $\rightarrow p \wedge \neg q$, I cannot visit Ho Chi Minh mausoleum if I do not go to Hanoi $\rightarrow \neg p \rightarrow \neg q$, Whenever I go to Hanoi, I visit Ho Chi Minh mausoleum. $\rightarrow p \rightarrow q$

Question 3

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let p, q be two propositions. Which propositions are logically equivalent to $p \rightarrow q$?

$\neg p \wedge q$ Answer 1

$\neg p \vee \neg q$ Answer 2

$\neg p \vee q$ Answer 3

$p \vee q$ Answer 4

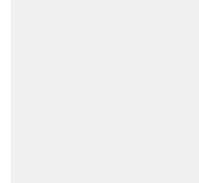
Feedback

The correct answer is: $\neg p \wedge q \rightarrow \text{No}$, $\neg p \vee \neg q \rightarrow \text{No}$, $\neg p \vee q \rightarrow \text{Yes}$, $p \vee q \rightarrow \text{No}$

Question 4

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let p, q be two propositions. Which propositions are logically equivalent to $\neg q \rightarrow \neg p$?

$\neg p \rightarrow \neg q$ Answer 1

$\neg p \vee q$ Answer 2

$p \rightarrow q$ Answer 3

$\neg q \rightarrow p$ Answer 4

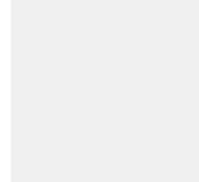
Feedback

The correct answer is: $\neg p \rightarrow \neg q \rightarrow \text{No}$, $\neg p \vee q \rightarrow \text{Yes}$, $p \rightarrow q \rightarrow \text{Yes}$, $\neg q \rightarrow p \rightarrow \text{No}$

Question 5

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $P(x)$ be a propositional function with domain $\{-1, 0, 1\}$

Which proposition on the left has the same truth value as the proposition on the right?

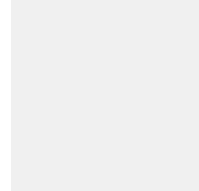
$\forall x((x \neq 1) \rightarrow \neg P(x))$	Answer 1	<input type="text" value="¬ P(-1) ^ ¬ P(0)"/>
$\exists x((x \neq 1) \wedge P(x))$	Answer 2	<input type="text" value="P(-1) v P(0)"/>
$\exists x \neg P(x)$	Answer 3	<input type="text" value="¬P(-1) v ¬P(0) v ¬P(1)"/>

Feedback

The correct answer is: $\forall x((x \neq 1) \rightarrow \neg P(x)) \rightarrow \neg P(-1) \wedge \neg P(0)$, $\exists x((x \neq 1) \wedge P(x)) \rightarrow P(-1) \vee P(0)$, $\exists x \neg P(x) \rightarrow \neg P(-1) \vee \neg P(0) \vee \neg P(1)$

Question 6

Complete
Mark 0.00 out of 1.00



Flag question

Question text

Let $E(x, y) = \text{"x emails y"}$.

Translate the sentence into logical expression, domain is all people.

"Each person received an email from another person"

Select one:

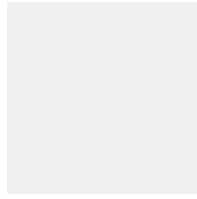
- ☐ a. None of the other choices is correct
- ☐ b. $\forall x \exists y((x \neq y) \wedge E(x, y))$
- ☐ c. $\exists x \forall y((x \neq y) \wedge E(x, y))$
- ☐ d. $\forall x \exists y((x \neq y) \wedge E(y, x))$
- ☒ e. $\forall x \exists y((x \neq y) \rightarrow E(y, x))$

Feedback

The correct answer is: $\forall x \exists y((x \neq y) \wedge E(y, x))$

Question 7

Complete
Mark 0.00 out of 1.00



Flag question

Question text

Given the argument:

"If I wake up early I will review yesterday's lecture. If I review yesterday's lecture I will do good on the test. Therefore, if I do good on the test that means I woke up early."

Choose correct statement:

Select one:

- ☐ a. This valid argument is based on modus tollens
- ☐ b. This argument is a fallacy
- ☐ c. This valid argument is based on modus ponens
- ☐ d. This valid argument is based on addition rule
- ☒ e. This valid argument is based on hypothetical syllogism

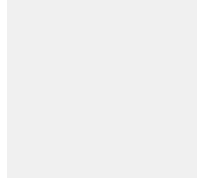
Feedback

The correct answer is: This argument is a fallacy

Question 8

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Which propositions are true, where domain is the set of all integers?

$$\forall x \exists y (x - y^2 > 100)$$

Answer 1

$$\forall x \exists y (xy = 3)$$

Answer 2

$$\forall x \exists y (x = y^{1/2})$$

Answer 3

$$\forall x \forall y ((x^2 = y^2) \rightarrow (|x| = |y|))$$

Answer 4

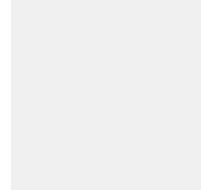
Feedback

The correct answer is: $\forall x \exists y (x - y^2 > 100) \rightarrow$ No, $\forall x \exists y (xy = 3) \rightarrow$ No, $\forall x \exists y (x = y^{1/2}) \rightarrow$ No, $\forall x \forall y ((x^2 = y^2) \rightarrow (|x| = |y|)) \rightarrow$ Yes

Question 9

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Can we conclude that $A=B$ if the sets A, B, C satisfy

$A \cap C = B \cap C$ và A, B đều là các tập con của C

$A \cup C = B \cup C$

$A - C = B - C$

Answer 1

Answer 2

Answer 3

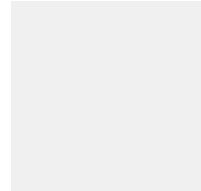
Feedback

The correct answer is: $A \cap C = B \cap C$ và A, B đều là các tập con của $C \rightarrow$ Yes, $A \cup C = B \cup C \rightarrow$ No, $A - C = B - C \rightarrow$ No

Question 10

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Find the cardinality of the set $\{a, \{a\}, \{a, \{a\}\}\}$.

Answer:

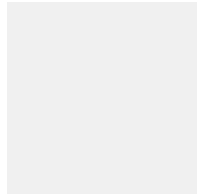
Feedback

The correct answer is: 3

Question 11

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\lfloor \frac{3}{2} + \lceil 3 + \frac{4}{5} \rceil \rfloor$

Answer:

5

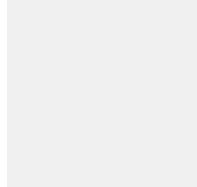
Feedback

The correct answer is: 5

Question 12

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $f \circ g(X) = aX + b$. Find $a + b$.

Answer:

39

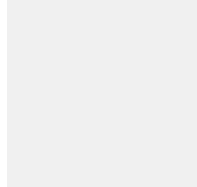
Feedback

The correct answer is: 39

Question 13

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\lfloor \frac{3}{2} - \lceil 3 + \frac{5}{4} \rceil \rfloor$

Answer:

-4

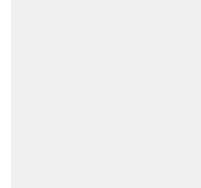
Feedback

The correct answer is: -4

Question 14

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f: \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$, $f(m, n) = n+1$. Choose correct answer:

Select one:

- ☐ a. $f(x)$ is neither one-to-one nor onto
- ☐ b. f is one-to-one but not onto
- ☐ c. f is a bijection
- ☒ d. f is onto but not one-to-one

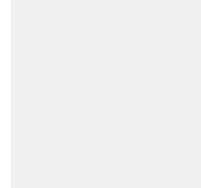
Feedback

The correct answer is: f is onto but not one-to-one

Question 15

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute

$$\sum_{i=1}^6 (2 \cdot 3^i + 3 \cdot 2^i).$$

Answer:

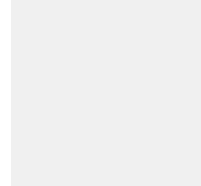
Feedback

The correct answer is: 2562

Question 1

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Who is the tallest and who is the shortest?

- If the tallest is not An then it must be Binh
- If Binh is not the shortest then Tam is the tallest

Select one:

- ☐ a. Binh is the tallest, Tam is the shortest
- ☐ b. An is the tallest, Tam is the shortest
- ☐ c. Binh is the tallest, An is the shortest
- ☒ d. An is tallest, Binh is shortest

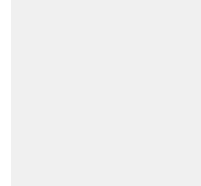
Feedback

The correct answer is: An is tallest, Binh is shortest

Question 2

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let p , q and r be propositions:

p = "You go to class regularly"

q = "You do all homework problems"

r = "You receive good grades"

Translate the sentence into logical expression:

"You go to class regularly and do all homework problems but your grades are still not good."

Select one:

- ☐ a. $p \wedge q \wedge r$
- ☒ b. $p \wedge q \wedge \neg r$
- ☐ c. Các lựa chọn còn lại đều sai
- ☐ d. $p \vee q \vee \neg r$
- ☐ e. $(p \wedge q) \rightarrow r$
- ☐ f. $(p \vee q) \rightarrow r$

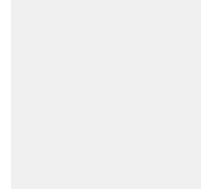
Feedback

The correct answer is: $p \wedge q \wedge \neg r$

Question 3

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Which proposition is logically equivalent to

$$(p \rightarrow q) \vee [\neg p \rightarrow (q \vee r)] ?$$

Select one:

- ☐ a. $p \vee q$
- ☒ b. T
- ☐ c. $p \vee q \vee r$
- ☐ d. $q \rightarrow r$
- ☐ e. $r \vee q$

Feedback

The correct answer is: T

Question 4

Complete

Mark 1.00 out of 1.00

Flag question

Question text

Let p, q be two propositions. Which propositions are logically equivalent to $\neg p \oplus q$?

$(\neg p \vee q) \wedge (p \vee \neg q)$ Answer 1

$(\neg p \vee q) \vee (p \vee \neg q)$ Answer 2

$(\neg p \vee q) \oplus (p \vee \neg q)$ Answer 3

Feedback

The correct answer is: $(\neg p \vee q) \wedge (p \vee \neg q) \rightarrow$ Yes, $(\neg p \vee q) \vee (p \vee \neg q) \rightarrow$ No, $(\neg p \vee q) \oplus (p \vee \neg q) \rightarrow$ No

Question 5

Complete

Mark 0.33 out of 1.00

Flag question

Question text

Which statements are correct?

$\forall x(P(x) \vee Q(x))$ and $\forall x P(x) \vee \forall x Q(x)$ have the same truth values

Answer 1

$\forall x(P(x) \wedge Q(x))$ and $\forall x P(x) \wedge \forall x Q(x)$ have the same truth values

Answer 2

$\forall x(P(x) \rightarrow Q(x))$ and $\forall x P(x) \rightarrow \forall x Q(x)$ have the same truth values

Answer 3

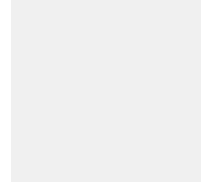
Feedback

The correct answer is: $\forall x(P(x) \vee Q(x))$ and $\forall x P(x) \vee \forall x Q(x)$ have the same truth values \rightarrow False, $\forall x(P(x) \wedge Q(x))$ and $\forall x P(x) \wedge \forall x Q(x)$ have the same truth values \rightarrow True, $\forall x(P(x) \rightarrow Q(x))$ and $\forall x P(x) \rightarrow \forall x Q(x)$ have the same truth values \rightarrow False

Question 6

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Let $E(x, y)$ = "x emails y".

Translate the sentence into logical expression, domain is all people.

"Some one received an email from another person"

Select one:

- ☐ a. $\exists x \exists y E(x, y)$
- ☐ b. $\exists x \exists y ((x \neq y) \wedge E(x, y))$
- ☒ c. $\exists x \exists y ((x \neq y) \rightarrow E(x, y))$
- ☐ d. $\exists x \exists y ((x \neq y) \vee E(x, y))$

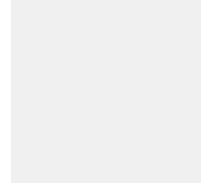
Feedback

The correct answer is: $\exists x \exists y ((x \neq y) \wedge E(x, y))$

Question 7

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Given an argument:

"If Jack is a soccer player then Jack is rich. Jack only plays pingpong. Therefore Jack is not rich."

Choose correct statement:

Select one:

- ☒ a. This argument is a fallacy
- ☐ b. This valid argument is based on disjunctive syllogism
- ☐ c. This valid argument is based on hypothetical syllogism
- ☐ d. This valid argument is based on modus ponens
- ☐ e. This valid argument is based on modus tollens

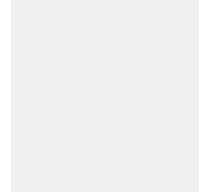
Feedback

The correct answer is: This argument is a fallacy

Question 8

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Find the negation of

$$\exists x \exists y (\forall z T(x, y, z) \vee Q(x, y)) ?$$

Select one:

- ☐ a. $\forall x \forall y (\exists z \neg T(x, y, z) \vee \neg Q(x, y))$
- ☒ b. $\forall x \forall y (\exists z \neg T(x, y, z) \wedge \neg Q(x, y))$
- ☐ c. $\forall x \forall y (\exists z T(x, y, z) \wedge Q(x, y))$
- ☐ d. $\forall x \exists y (\forall z \neg T(x, y, z) \wedge \neg Q(x, y))$

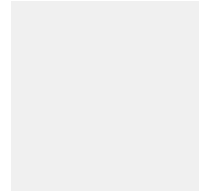
Feedback

The correct answer is: $\forall x \forall y (\exists z \neg T(x, y, z) \wedge \neg Q(x, y))$

Question 9

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Let A, B be sets. The statement

$$(A \cup B) \cap (\bar{A} \cup \bar{B}) = \emptyset$$

is True or False?

Select one:

☒ True

☐ False

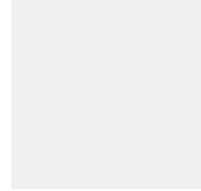
Feedback

The correct answer is 'False'.

Question 10

Complete

Mark 1.00 out of 1.00



Flag question

Question text

1 is an element of which set?

Select one:

☒ a. $\{1, \{1\}\}$

☐ b. $\{\{1\}, \{1, \{1\}\}\}$

☐ c. $\{\{\{1\}\}\}$

☐ d. $\{\{1\}, \{\{1\}\}\}$

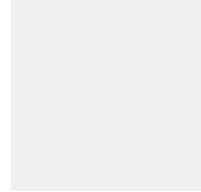
Feedback

The correct answer is: $\{1, \{1\}\}$

Question 11

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $f \circ g(X) = aX + b$. Find $a - b$.

Answer:

1

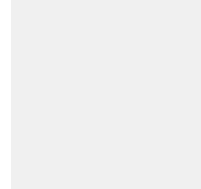
Feedback

The correct answer is: 1

Question 12

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $f \circ g(X) = aX + b$. Find $a + b$.

Answer:

39

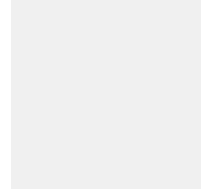
Feedback

The correct answer is: 39

Question 13

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\left\lfloor \frac{3}{2} - \left\lceil 3 + \frac{5}{4} \right\rceil \right\rfloor$

Answer:

-4

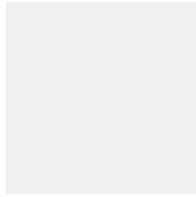
Feedback

The correct answer is: -4

Question 14

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f: \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$, $f(m, n) = n+1$. Choose correct answer:

Select one:

- ☐ a. f is a bijection
- ☐ b. f is one-to-one but not onto
- ☐ c. $f(x)$ is neither one-to-one nor onto
- ☒ d. f is onto but not one-to-one

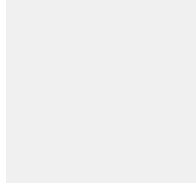
Feedback

The correct answer is: f is onto but not one-to-one

Question 15

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute

$$\sum_{i=10}^{20} i^2.$$

Answer:

Feedback

The correct answer is: 2585

Question 1

Complete

Mark 0.25 out of 1.00

Question text

Flag question

Which logical connectives are used?

Hồ Xuân Hương was born on 1/3 or 3/1.

Answer 1

Negation

No beer in this restaurant.

Answer 2

Disjunctive

In Vietnam you can make deposit using VND or USD.

Answer 3

Exclusive or

The first prize is 3 day tour of Singapore and 20 millions VND in cash.

Answer 4

Conjunction

Feedback

The correct answer is: Hồ Xuân Hương was born on 1/3 or 3/1. → Exclusive or, No beer in this restaurant. → Negation, In Vietnam you can make deposit using VND or USD. → Disjunctive, The first prize is 3 day tour of Singapore and 20 millions VND in cash. → Conjunction

Question 2

Complete

Mark 1.00 out of 1.00

Question text

Flag question

Given two propositions:

p = "I went to Paris."

q = "I visit Eiffel Tower"

Which sentence on the left corresponds to the expression on the right?

Whenever I go to Paris, I visit Eiffel Tower.

Answer 1

$p \rightarrow q$

I visit Eiffel Tower only if I go to Paris.

Answer 2

$q \rightarrow p$

I cannot visit Eiffel Tower if I do not go to

Answer 3

$\neg p \rightarrow \neg q$

Paris.

I went to Paris, but I did not visit Eiffel Tower. Answer 4

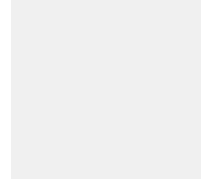
Feedback

The correct answer is: Whenever I go to Paris, I visit Eiffel Tower. $\rightarrow p \rightarrow q$, I visit Eiffel Tower only if I go to Paris. $\rightarrow q \rightarrow p$, I cannot visit Eiffel Tower if I do not go to Paris. $\rightarrow \neg p \rightarrow \neg q$, I went to Paris, but I did not visit Eiffel Tower. $\rightarrow p \wedge \neg q$

Question 3

Complete

Mark 0.25 out of 1.00



Flag question

Question text

Which propositions are logically equivalent to $p \leftrightarrow q$?

$\neg p \leftrightarrow q$ Answer 1

$\neg q \leftrightarrow \neg p$ Answer 2

$p \leftrightarrow \neg q$ Answer 3

$\neg p \leftrightarrow \neg q$ Answer 4

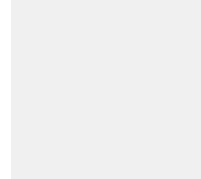
Feedback

The correct answer is: $\neg p \leftrightarrow q \rightarrow$ No, $\neg q \leftrightarrow \neg p \rightarrow$ Yes, $p \leftrightarrow \neg q \rightarrow$ No, $\neg p \leftrightarrow \neg q \rightarrow$ Yes

Question 4

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Which propositions are tautology?

$(p \wedge q) \rightarrow p$ Answer 1

$$(p \vee q) \rightarrow (p \rightarrow q)$$

Answer 2

Yes

$$(p \vee r) \wedge (\neg p \vee q) \rightarrow (q \vee r)$$

Answer 3

No

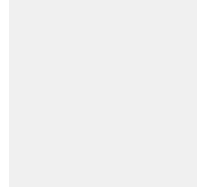
Feedback

The correct answer is: $(p \wedge q) \rightarrow p \rightarrow$ Yes, $(p \vee q) \rightarrow (p \rightarrow q) \rightarrow$ No, $(p \vee r) \wedge (\neg p \vee q) \rightarrow (q \vee r) \rightarrow$ Yes

Question 5

Complete

Mark 0.33 out of 1.00



Flag question

Question text

Which statements are correct?

$\forall x(P(x) \wedge Q(x))$ and $\forall x P(x) \wedge \forall x Q(x)$ have the same truth values

Answer 1

False

$\forall x(P(x) \vee Q(x))$ and $\forall x P(x) \vee \forall x Q(x)$ have the same truth values

Answer 2

True

$\forall x(P(x) \rightarrow Q(x))$ and $\forall x P(x) \rightarrow \forall x Q(x)$ have the same truth values

Answer 3

False

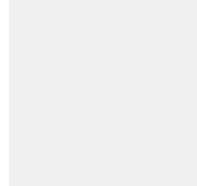
Feedback

The correct answer is: $\forall x(P(x) \wedge Q(x))$ and $\forall x P(x) \wedge \forall x Q(x)$ have the same truth values \rightarrow True, $\forall x(P(x) \vee Q(x))$ and $\forall x P(x) \vee \forall x Q(x)$ have the same truth values \rightarrow False, $\forall x(P(x) \rightarrow Q(x))$ and $\forall x P(x) \rightarrow \forall x Q(x)$ have the same truth values \rightarrow False

Question 6

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Translate the logical expression into sentence, domain is all real numbers

$$\forall x \forall y (((x < 0) \wedge (y < 0)) \rightarrow (xy > 0))$$

Select one:

- ☒ a. For each negative number x there is a negative number y such that xy is positive
- ☐ b. The product of two negative numbers is negative
- ☐ c. There is a negative number x and there is a negative number y such that xy is positive
- ☐ d. The product of two negative numbers is positive

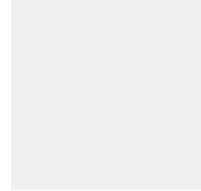
Feedback

The correct answer is: The product of two negative numbers is positive

Question 7

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Given the hypotheses:

- If I am lucky then I will pass the exam
- If I do all homework problems then I will pass the exam
- I passed the exam.

Which statement can be deduced from the above hypotheses?

Select one:

- ☐ a. None of the other choices is correct
- ☐ b. I am lucky
- ☐ c. I do all homework problems
- ☒ d. I do all homework problems and I am lucky

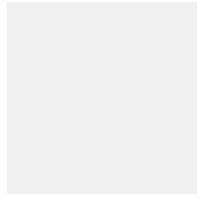
Feedback

The correct answer is: None of the other choices is correct

Question 8

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Find the negation of

$$\forall x \forall y (\exists z \neg T(x, y, z) \wedge Q(x, y))$$

Select one:

- ☐ a. $\exists x \exists y (\forall z \neg T(x, y, z) \vee Q(x, y))$.
- ☐ b. $\forall x \exists y (\forall z \neg T(x, y, z) \wedge \neg Q(x, y))$.
- ☒ c. $\exists x \exists y (\forall z T(x, y, z) \vee \neg Q(x, y))$.
- ☐ d. $\forall x \exists y (\forall z T(x, y, z) \vee Q(x, y))$.

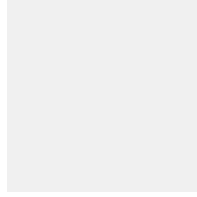
Feedback

The correct answer is: $\exists x \exists y (\forall z T(x, y, z) \vee \neg Q(x, y))$.

Question 9

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Determine if each statement is true or false.

$A \cup \mathbb{C} = \mathbb{C}$ Answer 1

$\mathbb{C} - A = \mathbb{C}$ Answer 2

$A \cap A = A$ Answer 3

$A - \mathbb{C} = \mathbb{C}$ Answer 4

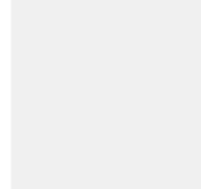
Feedback

The correct answer is: $A \cup \mathbb{C} = \mathbb{C} \rightarrow \text{False}$, $\mathbb{C} - A = \mathbb{C} \rightarrow \text{True}$, $A \cap A = A \rightarrow \text{True}$, $A - \mathbb{C} = \mathbb{C} \rightarrow \text{False}$

Question 10

Complete

Mark 0.75 out of 1.00



Flag question

Question text

Determine if each statement is true or false.

x is an element of the set $\{x\}$.

Answer 1

True

The empty set \emptyset is a subset of any set.

Answer 2

True

The cardinality of the empty set is 0.

Answer 3

False

0 is an element of the empty set \emptyset .

Answer 4

False

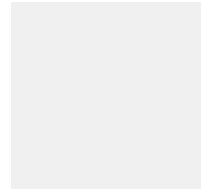
Feedback

The correct answer is: x is an element of the set $\{x\}$. $\rightarrow \text{True}$, The empty set \emptyset is a subset of any set. $\rightarrow \text{True}$, The cardinality of the empty set is 0. $\rightarrow \text{True}$, 0 is an element of the empty set \emptyset . $\rightarrow \text{False}$

Question 11

Complete

Mark 0.67 out of 1.00



Flag question

Question text

Choose correct answer:

$\lceil \lfloor x \rfloor \rceil = \lfloor x \rfloor$, for all real numbers x

Answer 1

Yes

$\lfloor 2x \rfloor = 2\lfloor x \rfloor$, for all real numbers x

Answer 2

Yes

$\lfloor x+y \rfloor = \lfloor x \rfloor + \lfloor y \rfloor$, for all real numbers x , y .

Answer 3

No

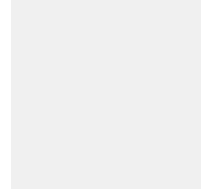
Feedback

The correct answer is: $\lceil(\lfloor x \rfloor)\rceil = \lfloor x \rfloor$, for all real numbers $x \rightarrow$ Yes, $\lfloor 2x \rfloor = 2\lfloor x \rfloor$, for all real numbers $x \rightarrow$ No, $\lfloor x+y \rfloor = \lfloor x \rfloor + \lfloor y \rfloor$, for all real numbers $x, y. \rightarrow$ No

Question 12

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $f \circ g(X) = aX + b$. Find $a + b$.

Answer:

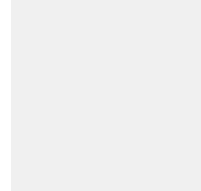
Feedback

The correct answer is: 39

Question 13

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Compute $\lfloor \frac{3}{2} - \lceil 3 + \frac{5}{4} \rceil \rfloor$

Answer:

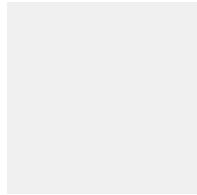
Feedback

The correct answer is: -4

Question 14

Complete

Mark 1.00 out of 1.00



Flag question

Question textFind

Let $f: \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$, $f(m, n) = n+1$. Choose correct answer:

Select one:

- ☐ a. f is a bijection
- ☐ b. f is one-to-one but not onto
- ☒ c. f is onto but not one-to-one
- ☐ d. $f(x)$ is neither one-to-one nor onto

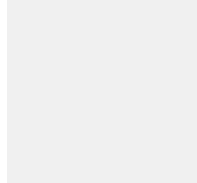
Feedback

The correct answer is: f is onto but not one-to-one

Question 15

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Compute

$$\sum_{i=1}^{11} (1 + (-1)^i).$$

Answer:

Feedback

The correct answer is: 10

Question 1

Complete

Mark 1.00 out of 1.00

Question text

Flag question

Find

$$(\neg 101011 \wedge 110011) \oplus 111011$$

Answer:

Feedback

The correct answer is: 101011

Question 2

Complete

Mark 1.00 out of 1.00

Question text

Flag question

Let p , q and r be propositions:

p : You go to class regularly

q : You do all homework problems

r : You receive good grades

Translate the sentence into logical expression:

" You receive good grades if and only if you go to class regularly and doing all homework problems".

Select one:

- ☐ a. $(p \vee q) \rightarrow r$
- ☐ b. $(p \wedge q) \rightarrow r$
- ☒ c. $r \leftrightarrow (p \wedge q)$
- ☐ d. $r \rightarrow (p \wedge q)$

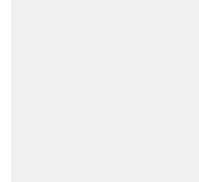
Feedback

The correct answer is: $r \leftrightarrow (p \wedge q)$

Question 3

Complete

Mark 0.33 out of 1.00



Flag question

Question text

Which propositions are contradiction?

$(p \rightarrow q) \vee (q \rightarrow p) \vee (p \oplus q)$ Answer 1

$[(p \rightarrow q) \vee (q \rightarrow p)] \wedge (p \oplus q)$ Answer 2

$(p \rightarrow q) \wedge (q \rightarrow p) \wedge (p \oplus q)$ Answer 3

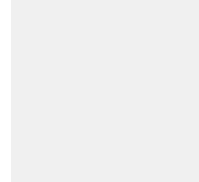
Feedback

The correct answer is: $(p \rightarrow q) \vee (q \rightarrow p) \vee (p \oplus q) \rightarrow$
No, $[(p \rightarrow q) \vee (q \rightarrow p)] \wedge (p \oplus q) \rightarrow$ No, $(p \rightarrow q) \wedge (q \rightarrow p) \wedge (p \oplus q) \rightarrow$ Yes

Question 4

Complete

Mark 0.33 out of 1.00



Flag question

Question text

Let p, q be two propositions. Which propositions are logically equivalent to $p \oplus q$?

$(p \vee q) \wedge (\neg p \vee \neg q)$ Answer 1

$(p \vee q) \oplus (\neg p \vee \neg q)$ Answer 2

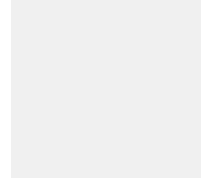
$(p \vee q) \vee (\neg p \vee \neg q)$ Answer 3

Feedback

The correct answer is: $(p \vee q) \wedge (\neg p \vee \neg q) \rightarrow$ Yes, $(p \vee q) \oplus (\neg p \vee \neg q) \rightarrow$
No, $(p \vee q) \vee (\neg p \vee \neg q) \rightarrow$ No

Question 5

Complete
Mark 1.00 out of 1.00



Flag question

Question text

Let $P(x)$ be a propositional function with domain $\{-1, 0, 1\}$

Which proposition on the left has the same truth value as the proposition on the right?

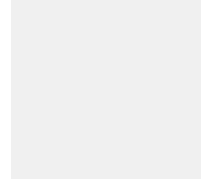
$\forall x P(x)$	Answer 1	<input type="text" value="P(-1)^P(0)^P(1)"/>
$\forall x((x \neq 0) \rightarrow P(x)) \wedge \exists x \neg P(x)$	Answer 2	<input type="text" value="P(-1)^{\neg P(0)}P(1)"/>
$\exists x P(x) \wedge \forall x((x \neq 0) \rightarrow \neg P(x))$	Answer 3	<input type="text" value="\neg P(-1)^P(0)^{\neg P(1)}"/>

Feedback

The correct answer is: $\forall x P(x) \rightarrow P(-1) \wedge P(0) \wedge P(1)$, $\forall x((x \neq 0) \rightarrow P(x)) \wedge \exists x \neg P(x) \rightarrow P(-1) \wedge \neg P(0) \wedge P(1)$, $\exists x P(x) \wedge \forall x((x \neq 0) \rightarrow \neg P(x)) \rightarrow \neg P(-1) \wedge P(0) \wedge \neg P(1)$

Question 6

Complete
Mark 0.00 out of 1.00



Flag question

Question text

Let

$P(x)$ = "x goes to class regularly"

$Q(x)$ = "x reads books"

$R(x)$ = "x passed the exam"

Translate the sentence into logical expression, domain is the set of all students in class.

"Some student who goes to class regularly and reads books has failed the exam"

Select one:

- ☒ a. $\exists x((P(x) \wedge Q(x)) \rightarrow \text{neg } R(x))$
- ☐ b. $\exists x(P(x) \wedge Q(x) \wedge \neg R(x))$
- ☐ c. $\exists x((P(x) \vee Q(x)) \rightarrow \neg R(x))$
- ☐ d. $\exists x(P(x) \vee Q(x) \vee \neg R(x))$
- ☐ e. None of the other choices is correct

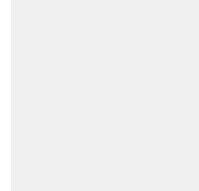
Feedback

The correct answer is: $\exists x(P(x) \wedge Q(x) \wedge \neg R(x))$

Question 7

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Given the argument:

"Students of class 1A must take either Discrete Math 1 or Advanced Math 2 this term. Discrete Math 1 is not on the schedule of this class. Therefore students of this class are taking Advanced Math 2."

Choose correct statement:

Select one:

- ☐ a. This valid argument is based on disjunctive syllogism
- ☐ b. This valid argument is based on addition rule
- ☒ c. This valid argument is based on hypothetical syllogism
- ☐ d. This argument is a fallacy
- ☐ e. This valid argument is based on modus tollens

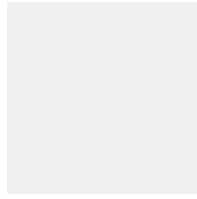
Feedback

The correct answer is: This valid argument is based on disjunctive syllogism

Question 8

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Find the negation of

$$\exists y(Q(x,y) \wedge \forall x \neg R(x,y))$$

Select one:

- ☐ a. $\forall y(\neg Q(x,y) \vee \forall x R(x,y))$.
- ☒ b. $\forall y(\neg Q(x,y) \vee \exists x R(x,y))$.
- ☐ c. $\forall y(\neg Q(x,y) \vee \exists x \neg R(x,y))$.
- ☐ d. $\forall y(\neg Q(x,y) \wedge \exists x R(x,y))$.

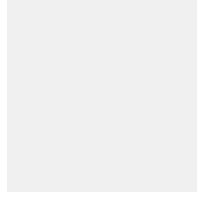
Feedback

The correct answer is: $\forall y(\neg Q(x,y) \vee \exists x R(x,y))$.

Question 9

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Which statements are FALSE? (A, B are sets)

Select one:

- ☒ a. $A - (B - A) = A - B$
- ☐ b. $A \cap (B - A) = \emptyset$
- ☐ c. $A \cup (B - A) = A \cup B$

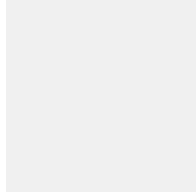
Feedback

The correct answer is: $A - (B - A) = A - B$

Question 10

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Which set has the maximum cardinality, where x is an integer.

Select one:

- ☐ a. $\{x | x^2 = 1\}$
- ☐ b. $\{x | x^2 = 2\}$
- ☒ c. $\{x | x^2 < 100\}$
- ☐ d. $\{x | 0 < x < 12\}$

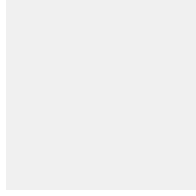
Feedback

The correct answer is: $\{x | x^2 < 100\}$

Question 11

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $g \circ f(X) = aX + b$. Find b .

Answer:

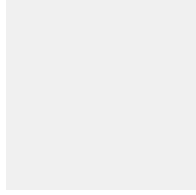
Feedback

The correct answer is: 19

Question 12

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $f \circ g(X) = aX + b$. Find $a + b$.

Answer:

39

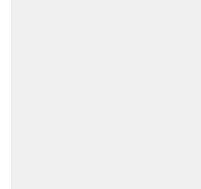
Feedback

The correct answer is: 39

Question 13

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\lfloor \frac{3}{2} - \lceil 3 + \frac{5}{4} \rceil \rfloor$

Answer:

-4

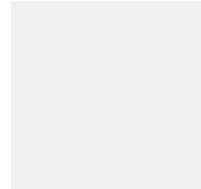
Feedback

The correct answer is: -4

Question 14

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f: \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$, $f(m, n) = n+1$. Choose correct answer:

Select one:

- ☐ a. $f(x)$ is neither one-to-one nor onto
- ☒ b. f is onto but not one-to-one
- ☐ c. f is a bijection
- ☐ d. f is one-to-one but not onto

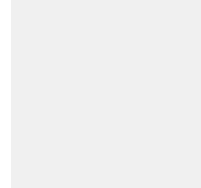
Feedback

The correct answer is: f is onto but not one-to-one

Question 15

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Given the sequence 1, 2, 2, 3, 3, 3, 4, 4, 4, 4, ...

Find the 200th term.

Answer:

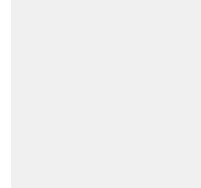
Feedback

The correct answer is: 20

Question 1

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Find

$(01010 \vee 10001) \oplus 01000$

Answer:

Feedback

The correct answer is: 10011

Question 2

Complete

Mark 1.00 out of 1.00

Question text

Flag question

Given two propositions:

p = "I go to Hanoi"

q = "I visit Sword Lake"

Which sentence on the left corresponds to the expression of the right?

I cannot visit Sword Lake if I do not go to Hanoi

Answer 1

Whenever I go to Hanoi, I visit Sword Lake.

Answer 2

I went to Hanoi, but I did not visit Sword Lake.

Answer 3

I visit Sword Lake only if I go to Hanoi.

Answer 4

Feedback

The correct answer is: I cannot visit Sword Lake if I do not go to Hanoi $\rightarrow \neg p \rightarrow \neg q$, Whenever I go to Hanoi, I visit Sword Lake. $\rightarrow p \rightarrow q$, I went to Hanoi, but I did not visit Sword Lake. $\rightarrow p \wedge \neg q$, I visit Sword Lake only if I go to Hanoi. $\rightarrow q \rightarrow p$

Question 3

Complete

Mark 1.00 out of 1.00

Question text

Flag question

Which propositions are logically equivalent to $p \leftrightarrow q$?

$\neg q \leftrightarrow \neg p$ Answer 1

$p \leftrightarrow \neg q$ Answer 2

$\neg p \leftrightarrow \neg q$ Answer 3

$\neg p \leftrightarrow q$ Answer 4

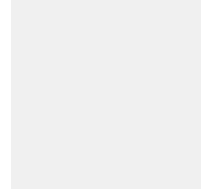
Feedback

The correct answer is: $\neg q \leftrightarrow \neg p \rightarrow$ Yes, $p \leftrightarrow \neg q \rightarrow$ No, $\neg p \leftrightarrow \neg q \rightarrow$ Yes, $\neg p \leftrightarrow q \rightarrow$ No

Question 4

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Which propositions are tautology?

$$(p \vee q) \rightarrow (p \rightarrow q)$$

Answer 1

No

$$(p \wedge q) \rightarrow p$$

Answer 2

Yes

$$(p \vee r) \wedge (\neg p \vee q) \rightarrow (q \vee r)$$

Answer 3

Yes

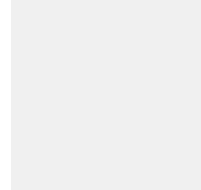
Feedback

The correct answer is: $(p \vee q) \rightarrow (p \rightarrow q) \rightarrow$ No, $(p \wedge q) \rightarrow p \rightarrow$ Yes, $(p \vee r) \wedge (\neg p \vee q) \rightarrow (q \vee r) \rightarrow$ Yes

Question 5

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $P(x)$ be a propositional function with domain $\{-1, 0, 1\}$

Which proposition on the left has the same truth value as the proposition on the right?

$$\exists x((x \neq 1) \wedge P(x))$$

Answer 1

$P(-1) \vee P(0)$

$$\exists x \neg P(x)$$

Answer 2

$\neg P(-1) \vee \neg P(0) \vee \neg P(1)$

$$\forall x((x \neq 1) \rightarrow \neg P(x))$$

Answer 3

$\neg P(-1) \wedge \neg P(0)$

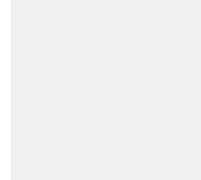
Feedback

The correct answer is: $\exists x((x \neq 1) \wedge P(x)) \rightarrow P(-1) \vee P(0), \exists x \neg P(x) \rightarrow \neg P(-1) \vee \neg P(0) \vee \neg P(1), \forall x((x \neq 1) \rightarrow \neg P(x)) \rightarrow \neg P(-1) \wedge \neg P(0)$

Question 6

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let

$P(x)$ = "x goes to class regularly"

$Q(x)$ = "x reads books"

$R(x)$ = "x passed the exam"

Translate the sentence into logical expression, domain is the set of all students in class.

"Any student who goes to class regularly or reads books passed the exam"

Select one:

- ☐ a. $\forall x((P(x) \vee Q(x)) \wedge R(x))$
- ☐ b. $\forall x((P(x) \wedge Q(x)) \rightarrow R(x))$
- ☐ c. $\forall x((P(x) \wedge Q(x)) \vee R(x))$
- ☒ d. $\forall x((P(x) \vee Q(x)) \rightarrow R(x))$
- ☐ e. None of the other choices is correct

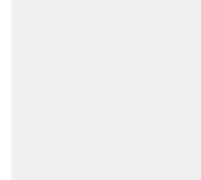
Feedback

The correct answer is: $\forall x((P(x) \vee Q(x)) \rightarrow R(x))$

Question 7

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Given the hypotheses:

- Every FPT students stays in the dorm.
- An is staying in the dorm.
- Binh is not staying in the dorm.

Which conclusion can be drawn?

Select one:

- ☐ a. An is a student of FPT
- ☐ b. Binh is not a student of FPT
- ☐ c. Binh is a student of FPT, and An is not.
- ☒ d. Binh is not a student of FPT, and An is.

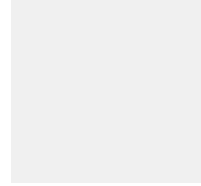
Feedback

The correct answer is: Binh is not a student of FPT

Question 8

Complete

Mark 0.25 out of 1.00



Flag question

Question text

Which pairs of propositions are logically equivalent?

$\forall x P(x,y)$ và $\forall y P(x,y)$

Answer 1

$\forall x \exists y P(x,y)$ và

Answer 2

$\exists x \forall y P(x,y)$

$\forall x \forall y P(x,y)$ và

Answer 3

$\forall y \forall x P(x,y)$

$\exists y P(x,y)$ và $\exists x P(x,y)$

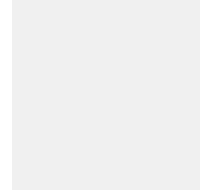
Answer 4

Feedback

The correct answer is: $\forall x P(x,y) \vee \forall y P(x,y) \rightarrow \text{No}, \forall x \exists y P(x,y)$
 $\vee \exists x \forall y P(x,y) \rightarrow \text{No}, \forall x \forall y P(x,y) \vee \forall y \forall x P(x,y) \rightarrow \text{Yes}, \exists y P(x,y)$
 $\vee \exists x P(x,y) \rightarrow \text{No}$

Question 9

Complete
Mark 0.00 out of 1.00



Flag question

Question text

Let $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$. Represent the subset $A = \{2, 5, 7, 8, 9, 10\}$ by a bit string where the i -th bit is 1 if and only if i is in A .

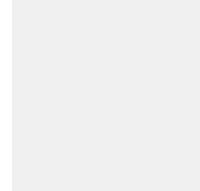
Answer:

Feedback

The correct answer is: 100101111

Question 10

Complete
Mark 1.00 out of 1.00



Flag question

Question text

Find the cardinality of the set $\{1, 2, 3, 2, 5, 6\}$

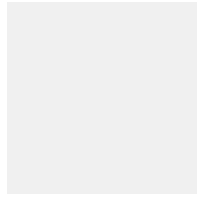
Answer:

Feedback

The correct answer is: 5

Question 11

Complete
Mark 0.50 out of 1.00



Flag question

Question text

Which rules are functions from \mathbb{R} to \mathbb{R} ?

$f(x) = 2x^2 + 1$ Answer 1

$f(x) = 1/x$ Answer 2

$f(x) = \sqrt{x}$ Answer 3

$f(x) = \ln(x)$ Answer 4

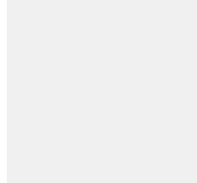
Feedback

The correct answer is: $f(x) = 2x^2 + 1 \rightarrow \text{Yes}$, $f(x) = 1/x \rightarrow \text{No}$, $f(x) = \sqrt{x} \rightarrow \text{No}$, $f(x) = \ln(x) \rightarrow \text{No}$

Question 12

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(x) = 5x + 4$, $g(x) = 4x + 3$. Suppose that $f \circ g(x) = ax + b$. Find $a + b$.

Answer:

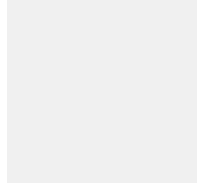
Feedback

The correct answer is: 39

Question 13

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\lfloor \frac{3}{2} - \lceil 3 + \frac{5}{4} \rceil \rfloor$

Answer:

-4

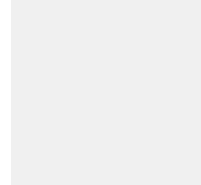
Feedback

The correct answer is: -4

Question 14

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Let $f: \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$, $f(m, n) = n+1$. Choose correct answer:

Select one:

- ☒ a. f is one-to-one but not onto
- ☐ b. f is a bijection
- ☐ c. f is onto but not one-to-one
- ☐ d. $f(x)$ is neither one-to-one nor onto

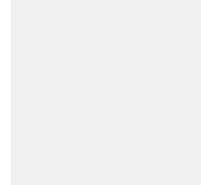
Feedback

The correct answer is: f is onto but not one-to-one

Question 15

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute

$$\sum_{i=0}^{10} (2^{i+1} - 2^i).$$

Answer:

2047

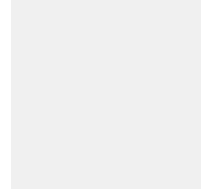
Feedback

The correct answer is: 2047

Question 1

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Find truth values of p, q so that the following proposition is True?

$$(p \vee q) \wedge (p \vee \neg q) \wedge (\neg p \vee q) \wedge (\neg p \vee \neg q)$$

Select one:

- ☒ a. $p = F, q = F$
- ☐ b. $p = T, q = T$
- ☐ c. $p = F, q = T$
- ☐ d. $p = T, q = F$
- ☐ e. None of the other choices is correct

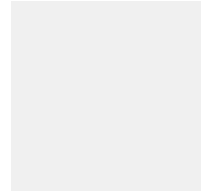
Feedback

The correct answer is: None of the other choices is correct

Question 2

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let p, q be propositions:

p = "You do all homework problems"

q = "You receive good grades"

Translate the sentence into logical expression:

"Doing all homework problems is enough to receive good grades".

Select one:

- ☒ a. $p \rightarrow q$
- ☐ b. $q \rightarrow p$
- ☐ c. Các lựa chọn còn lại đều sai
- ☐ d. $p \vee q$
- ☐ e. $p \wedge q$

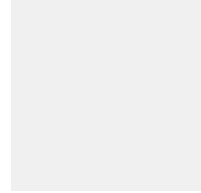
Feedback

The correct answer is: $p \rightarrow q$

Question 3

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Which proposition is logically equivalent to

$$(p \rightarrow q) \vee [\neg p \rightarrow (q \vee r)] ?$$

Select one:

- ☐ a. $p \vee q$
- ☐ b. $r \vee q$
- ☒ c. T
- ☐ d. $p \vee q \vee r$
- ☐ e. $q \rightarrow r$

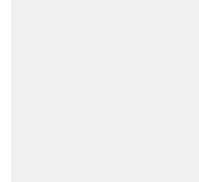
Feedback

The correct answer is: T

Question 4

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let p, q be two propositions. Which propositions are logically equivalent to $\neg p \oplus q$?

$(\neg p \vee q) \wedge (p \vee \neg q)$ Answer 1

$(\neg p \vee q) \vee (p \vee \neg q)$ Answer 2

$(\neg p \vee q) \oplus (p \vee \neg q)$ Answer 3

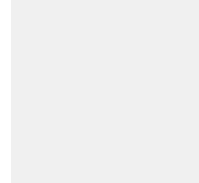
Feedback

The correct answer is: $(\neg p \vee q) \wedge (p \vee \neg q) \rightarrow$ Yes, $(\neg p \vee q) \vee (p \vee \neg q) \rightarrow$ No, $(\neg p \vee q) \oplus (p \vee \neg q) \rightarrow$ No

Question 5

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $P(x)$ be a propositional function with domain $\{-1, 0, 1\}$

Which proposition on the left has the same truth value as the proposition on the right?

$\exists x P(x) \wedge \forall x ((x \neq 0) \rightarrow \neg P(x))$ Answer 1

$\forall x ((x \neq 0) \rightarrow P(x)) \wedge \exists x \neg P(x)$ Answer 2

$\forall x P(x)$ Answer 3

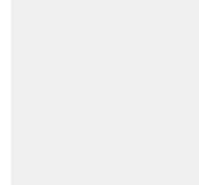
Feedback

The correct answer is: $\exists x P(x) \wedge \forall x ((x \neq 0) \rightarrow \neg P(x)) \rightarrow \neg P(-1) \wedge P(0) \wedge \neg P(1)$, $\forall x ((x \neq 0) \rightarrow P(x)) \wedge \exists x \neg P(x) \rightarrow P(-1) \wedge \neg P(0) \wedge P(1)$, $\forall x P(x) \rightarrow P(-1) \wedge P(0) \wedge P(1)$

Question 6

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Translate the logical expression into sentence, domain is all real numbers

$$\forall x \forall y ((xy = 0) \rightarrow ((x = 0) \vee (y = 0)))$$

Select one:

- ☐ a. If the product of two numbers is 0 then at least one of them is 0
- ☒ b. If $x = 0$ then for all y we have $xy = 0$
- ☐ c. If the product of two numbers is 0 then both of them are 0
- ☐ d. The product of 0 and 0 is 0

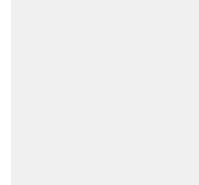
Feedback

The correct answer is: If the product of two numbers is 0 then at least one of them is 0

Question 7

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Recall two fallacies:

(I) $[(p \rightarrow q) \wedge q] \rightarrow p$

(II) $[(p \rightarrow q) \wedge \neg p] \rightarrow \neg q$

Given the statement:

"In a right triangle, the sum of three angles is 180°. Let ABC be any triangle. The sum of three angles of ABC is 180°, therefore ABC is right triangle"

Choose correct statement:

Select one:

- ☐ a. This is a valid argument
- ☐ b. This is a fallacy of type (II)
- ☒ c. This is a fallacy of type (I)

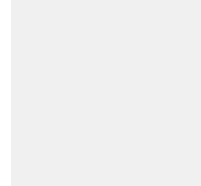
Feedback

The correct answer is: This is a fallacy of type (I)

Question 8

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Find the negation of

$$\exists x \forall y (\exists z T(x, y, z) \wedge Q(x, y))$$

Select one:

- ☐ a. $\forall x \exists y (\forall z T(x, y, z) \vee Q(x, y))$.
- ☒ b. $\forall x \exists y (\forall z \neg T(x, y, z) \vee Q(x, y))$.
- ☐ c. $\forall x \exists y (\forall z \neg T(x, y, z) \wedge \neg Q(x, y))$.
- ☐ d. $\forall x \exists y (\forall z \neg T(x, y, z) \vee \neg Q(x, y))$.

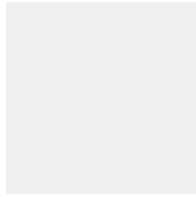
Feedback

The correct answer is: $\forall x \exists y (\forall z \neg T(x, y, z) \vee \neg Q(x, y))$.

Question 9

Complete

Mark 0.50 out of 1.00



Flag question

Question text

Which statements are true? (A, B are sets)

$$A \cap B = B \cap A.$$

Answer 1

True

$$\{1, 2, 2, 3, 5\} = \{1, 2, 3, 5\}$$

Answer 2

True

$$\mathbb{C} = \{\mathbb{C}\}$$

Answer 3

True

$$\overline{A \cap B} = \overline{A} \cup \overline{B}$$

Answer 4

False

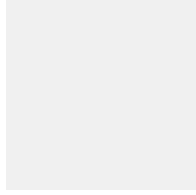
Feedback

The correct answer is: $A \cap B = B \cap A. \rightarrow \text{True}$, $\{1, 2, 2, 3, 5\} = \{1, 2, 3, 5\} \rightarrow \text{True}$, $\mathbb{C} = \{\mathbb{C}\} \rightarrow \text{False}$, $\overline{A \cap B} = \overline{A} \cup \overline{B} \rightarrow \text{True}$

Question 10

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Let $A=\{0, a\}$, $B=\{0, b\}$. Find the cardinality of the set $P(A \times B)$.

Answer:

4

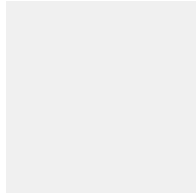
Feedback

The correct answer is: 16

Question 11

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\lfloor \frac{3}{2} - \lceil 3 + \frac{4}{5} \rceil \rfloor$

Answer:

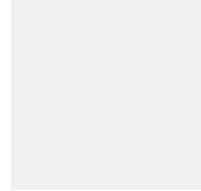
Feedback

The correct answer is: -3

Question 12

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $f \circ g(X) = aX + b$. Find $a + b$.

Answer:

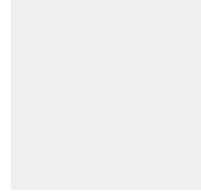
Feedback

The correct answer is: 39

Question 13

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\lfloor \frac{3}{2} - \lceil 3 + \frac{5}{4} \rceil \rfloor$

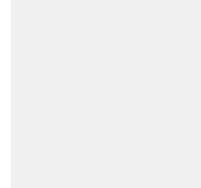
Answer:

Feedback

The correct answer is: -4

Question 14

Complete
Mark 0.00 out of 1.00



Flag question

Question text

Let $f: \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$, $f(m, n) = n+1$. Choose correct answer:

Select one:

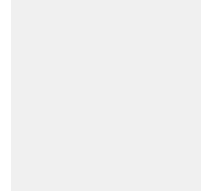
- ☐ a. f is a bijection
- ☒ b. f is one-to-one but not onto
- ☐ c. $f(x)$ is neither one-to-one nor onto
- ☐ d. f is onto but not one-to-one

Feedback

The correct answer is: f is onto but not one-to-one

Question 15

Complete
Mark 1.00 out of 1.00



Flag question

Question text

Compute

$$\sum_{i=20}^{30} i^2.$$

Answer:

Feedback

The correct answer is: 6985

Question 1

Complete
Mark 0.00 out of 1.00

Flag question

Question text

Find truth values of p, q so that the following proposition is True?

$$(p \vee q) \wedge (p \vee \neg q) \wedge (\neg p \vee q) \wedge (\neg p \vee \neg q)$$

Select one:

- ☒ a. $p = F, q = F$
- ☐ b. $p = T, q = T$
- ☐ c. $p = F, q = T$
- ☐ d. $p = T, q = F$
- ☐ e. None of the other choices is correct

Feedback

The correct answer is: None of the other choices is correct

Question 2

Complete

Mark 1.00 out of 1.00

Flag question

Question text

Let p, q be propositions:

p = "You do all homework problems"

q = "You receive good grades"

Translate the sentence into logical expression:

"Doing all homework problems is enough to receive good grades".

Select one:

- ☒ a. $p \rightarrow q$
- ☐ b. $q \rightarrow p$

- ☐ c. Các lựa chọn còn lại đều sai
- ☐ d. $p \vee q$
- ☐ e. $p \wedge q$

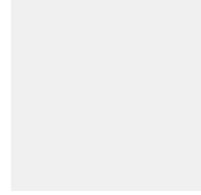
Feedback

The correct answer is: $p \rightarrow q$

Question 3

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Which proposition is logically equivalent to

$$(p \rightarrow q) \vee [\neg p \rightarrow (q \vee r)] ?$$

Select one:

- ☐ a. $p \vee q$
- ☐ b. $r \vee q$
- ☒ c. T
- ☐ d. $p \vee q \vee r$
- ☐ e. $q \rightarrow r$

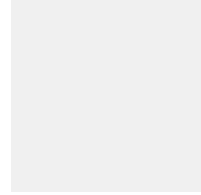
Feedback

The correct answer is: T

Question 4

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let p, q be two propositions. Which propositions are logically equivalent to $\neg p \oplus q$?

$(\neg p \vee q) \wedge (p \vee \neg q)$ Answer 1

$(\neg p \vee q) \vee (p \vee \neg q)$ Answer 2

$(\neg p \vee q) \oplus (p \vee \neg q)$ Answer 3

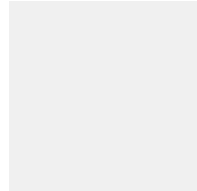
Feedback

The correct answer is: $(\neg p \vee q) \wedge (p \vee \neg q) \rightarrow \text{Yes}$, $(\neg p \vee q) \vee (p \vee \neg q) \rightarrow \text{No}$, $(\neg p \vee q) \oplus (p \vee \neg q) \rightarrow \text{No}$

Question 5

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $P(x)$ be a propositional function with domain $\{-1, 0, 1\}$

Which proposition on the left has the same truth value as the proposition on the right?

$\exists x P(x) \wedge \forall x ((x \neq 0) \rightarrow \neg P(x))$ Answer 1

$\forall x ((x \neq 0) \rightarrow P(x)) \wedge \exists x \neg P(x)$ Answer 2

$\forall x P(x)$ Answer 3

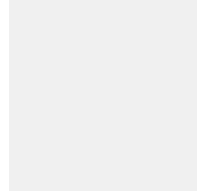
Feedback

The correct answer is: $\exists x P(x) \wedge \forall x ((x \neq 0) \rightarrow \neg P(x)) \rightarrow \neg P(-1) \wedge P(0) \wedge \neg P(1)$, $\forall x ((x \neq 0) \rightarrow P(x)) \wedge \exists x \neg P(x) \rightarrow P(-1) \wedge \neg P(0) \wedge P(1)$, $\forall x P(x) \rightarrow P(-1) \wedge P(0) \wedge P(1)$

Question 6

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Translate the logical expression into sentence, domain is all real numbers

$$\forall x \forall y ((xy = 0) \rightarrow ((x = 0) \vee (y = 0)))$$

Select one:

- ☐ a. If the product of two numbers is 0 then at least one of them is 0
- ☒ b. If $x = 0$ then for all y we have $xy = 0$
- ☐ c. If the product of two numbers is 0 then both of them are 0
- ☐ d. The product of 0 and 0 is 0

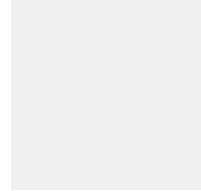
Feedback

The correct answer is: If the product of two numbers is 0 then at least one of them is 0

Question 7

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Recall two fallacies:

(I) $[(p \rightarrow q) \wedge q] \rightarrow p$

(II) $[(p \rightarrow q) \wedge \neg p] \rightarrow \neg q$

Given the statement:

"In a right triangle, the sum of three angles is 180° . Let ABC be any triangle. The sum of three angles of ABC is 180° , therefore ABC is right triangle"

Choose correct statement:

Select one:

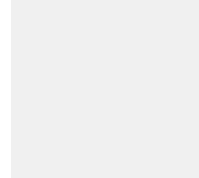
- ☐ a. This is a valid argument
- ☐ b. This is a fallacy of type (II)
- ☒ c. This is a fallacy of type (I)

Feedback

The correct answer is: This is a fallacy of type (I)

Question 8

Complete
Mark 0.00 out of 1.00



Flag question

Question text

Find the negation of

$$\exists x \forall y (\exists z T(x, y, z) \wedge Q(x, y))$$

Select one:

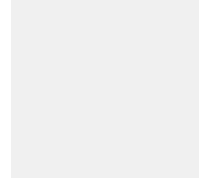
- ☐ a. $\forall x \exists y (\forall z T(x, y, z) \vee Q(x, y))$.
- ☒ b. $\forall x \exists y (\forall z \neg T(x, y, z) \vee Q(x, y))$.
- ☐ c. $\forall x \exists y (\forall z \neg T(x, y, z) \wedge \neg Q(x, y))$.
- ☐ d. $\forall x \exists y (\forall z \neg T(x, y, z) \vee \neg Q(x, y))$.

Feedback

The correct answer is: $\forall x \exists y (\forall z \neg T(x, y, z) \vee \neg Q(x, y))$.

Question 9

Complete
Mark 0.50 out of 1.00



Flag question

Question text

Which statements are true? (A, B are sets)

$A \cap B = B \cap A$. Answer 1

$\{1, 2, 2, 3, 5\} = \{1, 2, 3, 5\}$ Answer 2

$\mathbb{E} = \{\mathbb{E}\}$ Answer 3

$\overline{A \cap B} = \overline{A} \cup \overline{B}$ Answer 4

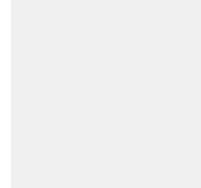
Feedback

The correct answer is: $A \cap B = B \cap A \rightarrow \text{True}$, $\{1, 2, 2, 3, 5\} = \{1, 2, 3, 5\} \rightarrow \text{True}$, $\mathbb{E} = \{\mathbb{E}\} \rightarrow \text{False}$, $\overline{A \cap B} = \overline{A} \cup \overline{B} \rightarrow \text{True}$

Question 10

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Let $A=\{0, a\}$, $B=\{0, b\}$. Find the cardinality of the set $P(A \times B)$.

Answer:

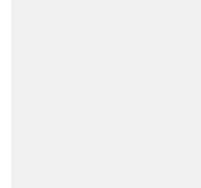
Feedback

The correct answer is: 16

Question 11

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\lfloor \frac{3}{2} - \lceil 3 + \frac{4}{5} \rceil \rfloor$

Answer:

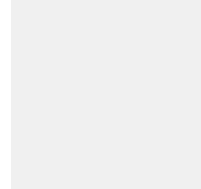
Feedback

The correct answer is: -3

Question 12

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $f \circ g(X) = aX + b$. Find $a + b$.

Answer:

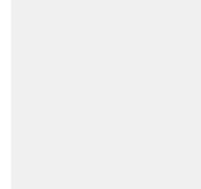
Feedback

The correct answer is: 39

Question 13

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\lfloor \frac{3}{2} - \lceil 3 + \frac{5}{4} \rceil \rfloor$

Answer:

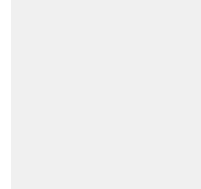
Feedback

The correct answer is: -4

Question 14

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Let $f: \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$, $f(m, n) = n+1$. Choose correct answer:

Select one:

- ☐ a. f is a bijection
- ☒ b. f is one-to-one but not onto
- ☐ c. $f(x)$ is neither one-to-one nor onto
- ☐ d. f is onto but not one-to-one

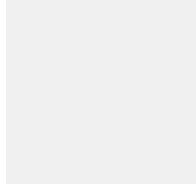
Feedback

The correct answer is: f is onto but not one-to-one

Question 15

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute

$$\sum_{i=20}^{30} i^2.$$

Answer:

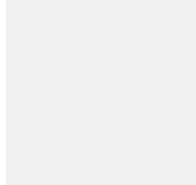
Feedback

The correct answer is: 6985

Question 1

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Find

$$(10100 \wedge 11001) \oplus 01101$$

Answer:

Feedback

The correct answer is: 11101

Question 2

Complete

Mark 0.00 out of 1.00

Question text

Flag question

Let p, q be propositions:

p = "You do all homework problems"

q = "You receive good grades"

Translate the sentence into logical expression:

"It is necessary that you do all homework problems to receive good grades."

Select one:

- ☐ a. $q \rightarrow p$
- ☒ b. $p \rightarrow q$
- ☐ c. Các lựa chọn còn lại đều sai
- ☐ d. $p \wedge q$
- ☐ e. $p \vee q$

Feedback

The correct answer is: $q \rightarrow p$

Question 3

Complete

Mark 0.50 out of 1.00

Question text

Flag question

Let p, q be two propositions. Which propositions are logically equivalent to $p \rightarrow q$?

- | | | |
|----------------------|----------|----------------------------------|
| $\neg p \wedge q$ | Answer 1 | <input type="text" value="No"/> |
| $\neg p \vee q$ | Answer 2 | <input type="text" value="No"/> |
| $p \vee q$ | Answer 3 | <input type="text" value="No"/> |
| $\neg p \vee \neg q$ | Answer 4 | <input type="text" value="Yes"/> |

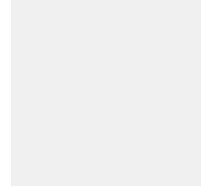
Feedback

The correct answer is: $\neg p \wedge q \rightarrow$ No, $\neg p \vee q \rightarrow$ Yes, $p \vee q \rightarrow$ No, $\neg p \vee \neg q \rightarrow$ No

Question 4

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let p, q be two propositions. Which propositions are logically equivalent to $\neg q \rightarrow \neg p$?

$\neg q \rightarrow p$	Answer 1	<input type="text" value="No"/>
$\neg p \vee q$	Answer 2	<input type="text" value="Yes"/>
$p \rightarrow q$	Answer 3	<input type="text" value="Yes"/>
$\neg p \rightarrow \neg q$	Answer 4	<input type="text" value="No"/>

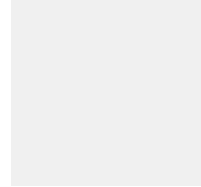
Feedback

The correct answer is: $\neg q \rightarrow p \rightarrow$ No, $\neg p \vee q \rightarrow$ Yes, $p \rightarrow q \rightarrow$ Yes, $\neg p \rightarrow \neg q \rightarrow$ No

Question 5

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Which statements are correct?

$\forall x(P(x) \wedge Q(x))$ and $\forall x P(x) \wedge \forall x Q(x)$ have the same truth values	Answer 1	<input type="text" value="True"/>
$\forall x(P(x) \vee Q(x))$ and $\forall x P(x) \vee \forall x Q(x)$ have the same truth values	Answer 2	<input type="text" value="False"/>
$\forall x(P(x) \rightarrow Q(x))$ and $\forall x P(x) \rightarrow \forall x Q(x)$ have the same truth values	Answer 3	<input type="text" value="False"/>

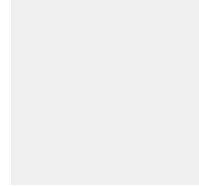
Feedback

The correct answer is: $\forall x(P(x) \wedge Q(x))$ and $\forall x P(x) \wedge \forall x Q(x)$ have the same truth values \rightarrow True, $\forall x(P(x) \vee Q(x))$ and $\forall x P(x) \vee \forall x Q(x)$ have the same truth values \rightarrow False, $\forall x(P(x) \rightarrow Q(x))$ and $\forall x P(x) \rightarrow \forall x Q(x)$ have the same truth values \rightarrow False

Question 6

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let:

$P(x)$ = "x can swim"

$Q(x)$ = "x is healthy"

Match the proposition on the left with the sentence on the right

$\exists x(\neg P(x) \wedge Q(x))$	Answer 1	Some one can not swim but is healthy
$\forall x(P(x) \rightarrow Q(x))$	Answer 2	Any one who can swim is healthy
$\exists x(P(x) \wedge \neg Q(x))$	Answer 3	Some one can swim but is not healthy
$\forall x(Q(x) \rightarrow P(x))$	Answer 4	Any healthy person can swim

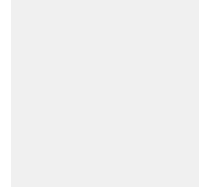
Feedback

The correct answer is: $\exists x(\neg P(x) \wedge Q(x)) \rightarrow$ Some one can not swim but is healthy, $\forall x(P(x) \rightarrow Q(x)) \rightarrow$ Any one who can swim is healthy, $\exists x(P(x) \wedge \neg Q(x)) \rightarrow$ Some one can swim but is not healthy, $\forall x(Q(x) \rightarrow P(x)) \rightarrow$ Any healthy person can swim

Question 7

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Recall two fallacies:

(I) $[(p \rightarrow q) \wedge q] \rightarrow p$

(II) $[(p \rightarrow q) \wedge \neg p] \rightarrow \neg q$

Given the statement:

"In a right triangle, the sum of three angles is 180° . Therefore, the sum of three angles of an acute triangle is not 180° ."

Choose correct statement:

Select one:

- ☐ a. This is a valid argument
- ☒ b. This is a fallacy of type (I)
- ☐ c. This is a fallacy of type (II)

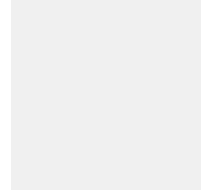
Feedback

The correct answer is: This is a fallacy of type (II)

Question 8

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Find the negation of

$$\exists x \forall y (\exists z T(x, y, z) \wedge \neg Q(x, y))$$

Select one:

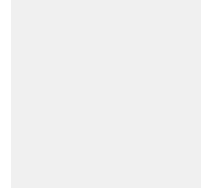
- ☐ a. $\forall x \exists y (\forall z T(x, y, z) \vee Q(x, y))$.
- ☒ b. $\forall x \exists y (\forall z \neg T(x, y, z) \vee Q(x, y))$.
- ☐ c. $\forall x \forall y (\forall z \neg T(x, y, z) \wedge Q(x, y))$.
- ☐ d. $\forall x \exists y (\forall z \neg T(x, y, z) \wedge \neg Q(x, y))$.

Feedback

The correct answer is: $\forall x \exists y (\forall z \neg T(x, y, z) \vee Q(x, y))$.

Question 9

Complete
Mark 0.00 out of 1.00



Flag question

Question text

Let A, B be sets. The statement

$$A \cup (B \cap \bar{A}) = A \cup B$$

is True or False?

Select one:

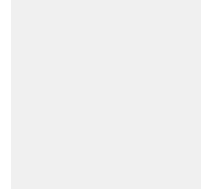
- ☐ True
☒ False

Feedback

The correct answer is 'True'.

Question 10

Complete
Mark 1.00 out of 1.00



Flag question

Question text

Let $A = \{0, a\}$, $B = \{0, b\}$. Determine $A \times B$.

Select one:

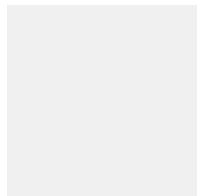
- ☐ a. $\{(0,0), (a, b)\}$
☒ b. $\{(0,0), (0, b), (a, 0), (a, b)\}$
☐ c. $\{(0,0), (0, b), (a, 0), (a, b), (b, a), (0, a), (b, 0)\}$
☐ d. $\{(0,0), (b, a), (0, a), (b, 0)\}$

Feedback

The correct answer is: $\{(0,0), (0, b), (a, 0), (a, b)\}$

Question 11

Complete
Mark 1.00 out of 1.00



Flag question

Question text

Compute $\lceil \left(\frac{7}{2}\right)^2 \rceil - \left(\lceil \frac{7}{2} \rceil\right)^2$

Answer:

-3

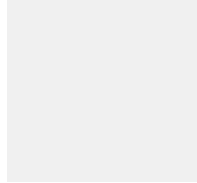
Feedback

The correct answer is: -3

Question 12

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $f \circ g(X) = aX + b$. Find $a + b$.

Answer:

39

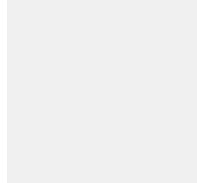
Feedback

The correct answer is: 39

Question 13

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\lfloor \frac{3}{2} - \lceil 3 + \frac{5}{4} \rceil \rfloor$

Answer:

-4

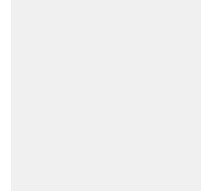
Feedback

The correct answer is: -4

Question 14

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Let $f: \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$, $f(m, n) = n+1$. Choose correct answer:

Select one:

- ☐ a. f is onto but not one-to-one
- ☐ b. f is a bijection
- ☒ c. f is one-to-one but not onto
- ☐ d. $f(x)$ is neither one-to-one nor onto

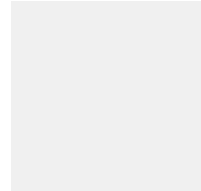
Feedback

The correct answer is: f is onto but not one-to-one

Question 15

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\sum_{j=0}^3 \sum_{i=0}^2 ij$

Select one:

- ☐ a. 20
- ☐ b. Lựa chọn khác

- ☒ c. 18
- ☐ d. 16
- ☐ e. 24

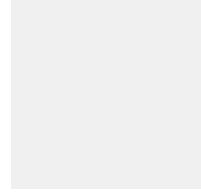
Feedback

The correct answer is: 18

Question 1

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Find

$$(\neg 1010111 \wedge 1100111) \oplus 1110111$$

Answer:

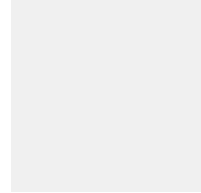
Feedback

The correct answer is: 1010111

Question 2

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let p , q and r be propositions:

p : You go to class regularly

q : You do all homework problems

r : You receive good grades

Translate the sentence into logical expression:

"If you go to class regularly and do all homework problems you will receive good grades".

Select one:

- ☒ a. $(p \wedge q) \rightarrow r$
☐ b. $(p \vee q) \rightarrow r$
☐ c. $r \rightarrow (p \wedge q)$
☐ d. $(p \vee q) \leftrightarrow r$

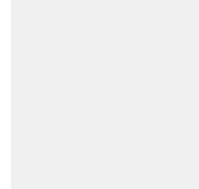
Feedback

The correct answer is: $(p \wedge q) \rightarrow r$

Question 3

Complete

Mark 0.33 out of 1.00



Flag question

Question text

Which propositions are contradiction?

$(p \rightarrow q) \wedge (q \rightarrow p) \wedge (p \oplus q)$ Answer 1

$[(p \rightarrow q) \vee (q \rightarrow p)] \wedge (p \oplus q)$ Answer 2

$(p \rightarrow q) \vee (q \rightarrow p) \vee (p \oplus q)$ Answer 3

Feedback

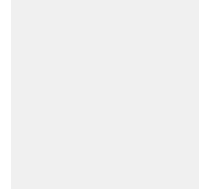
The correct answer is: $(p \rightarrow q) \wedge (q \rightarrow p) \wedge (p \oplus q) \rightarrow$

Yes, $[(p \rightarrow q) \vee (q \rightarrow p)] \wedge (p \oplus q) \rightarrow$ No, $(p \rightarrow q) \vee (q \rightarrow p) \vee (p \oplus q) \rightarrow$ No

Question 4

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let p, q be two propositions. Which propositions are logically equivalent to $p \rightarrow q$?

$\neg q \rightarrow \neg p$ Answer 1

$\neg p \rightarrow \neg q$ Answer 2

$\neg q \rightarrow p$ Answer 3

$\neg p \rightarrow q$ Answer 4

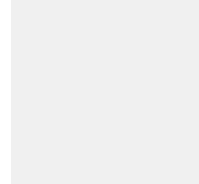
Feedback

The correct answer is: $\neg q \rightarrow \neg p \rightarrow$ Yes, $\neg p \rightarrow \neg q \rightarrow$ No, $\neg q \rightarrow p \rightarrow$ No, $\neg p \rightarrow q \rightarrow$ No

Question 5

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $P(x)$ be a propositional function with domain $\{-1, 0, 1\}$

Which proposition on the left has the same truth value as the proposition on the right?

$\exists x \neg P(x)$ Answer 1

$\exists x ((x \neq 1) \wedge P(x))$ Answer 2

$\forall x ((x \neq 1) \rightarrow \neg P(x))$ Answer 3

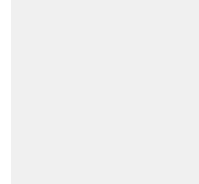
Feedback

The correct answer is: $\exists x \neg P(x) \rightarrow \neg P(-1) \vee \neg P(0) \vee \neg P(1)$, $\exists x ((x \neq 1) \wedge P(x)) \rightarrow P(-1) \vee P(0)$, $\forall x ((x \neq 1) \rightarrow \neg P(x)) \rightarrow \neg P(-1) \wedge \neg P(0)$

Question 6

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let

$P(x)$ = "x is a real number"

$Q(x)$ = "x is a rational number"

Match the proposition on the left with the sentence on the right.

$\neg \exists x (\neg P(x) \wedge Q(x))$	Answer 1 <input type="text" value="There does not exist a rational number that is not a real number"/>
$\forall x (Q(x) \rightarrow P(x))$	Answer 2 <input type="text" value="Any rational number is a real number"/>
$\exists x (P(x) \wedge Q(x))$	Answer 3 <input type="text" value="There is a number that is both real and rational"/>
$\exists x (P(x) \wedge \neg Q(x))$	Answer 4 <input type="text" value="There is a real number that is not rational"/>

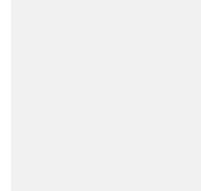
Feedback

The correct answer is: $\neg \exists x (\neg P(x) \wedge Q(x)) \rightarrow$ There does not exist a rational number that is not a real number, $\forall x (Q(x) \rightarrow P(x)) \rightarrow$ Any rational number is a real number, $\exists x (P(x) \wedge Q(x)) \rightarrow$ There is a number that is both real and rational, $\exists x (P(x) \wedge \neg Q(x)) \rightarrow$ There is a real number that is not rational

Question 7

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Given an argument:

"If Jack is a soccer player then Jack is rich. Jack is not rich. Therefore Jack is not a soccer player."

Choose correct statement:

Select one:

- ☒ a. This argument is a fallacy
- ☐ b. This valid argument is based on disjunctive syllogism
- ☐ c. This valid argument is based on modus ponens
- ☐ d. This valid argument is based on modus tollens
- ☐ e. This valid argument is based on hypothetical syllogism

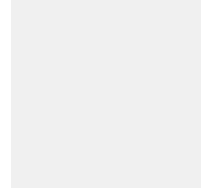
Feedback

The correct answer is: This valid argument is based on modus tollens

Question 8

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Find the negation of

$$\exists x \forall y (\exists z T(x, y, z) \wedge Q(x, y))$$

Select one:

- ☐ a. $\forall x \exists y (\forall z \neg T(x, y, z) \vee \neg Q(x, y))$.
- ☐ b. $\forall x \exists y (\forall z T(x, y, z) \vee Q(x, y))$.
- ☒ c. $\forall x \exists y (\forall z \neg T(x, y, z) \vee Q(x, y))$.
- ☐ d. $\forall x \exists y (\forall z \neg T(x, y, z) \wedge \neg Q(x, y))$.

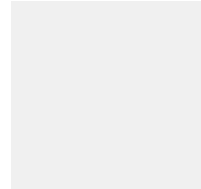
Feedback

The correct answer is: $\forall x \exists y (\forall z \neg T(x, y, z) \vee \neg Q(x, y))$.

Question 9

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Let $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$. Represent the subset $A = \{1, 4, 5, 7, 9\}$ by a bit string where the i -th bit is 1 if and only if i is in A .

Answer:

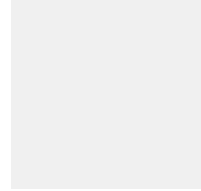
Feedback

The correct answer is: 1001101010

Question 10

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Let $A=\{0, a\}$, $B=\{0, b\}$. Determine $B \times A$.

Select one:

- ☒ a. $\{(0,0), (0, b), (a, 0), (a, b)\}$
- ☐ b. $\{(0,0), (a, b)\}$
- ☐ c. $\{(0,0), (b, a), (0, a), (b, 0)\}$
- ☐ d. $\{(0,0), (0, b), (a, 0), (a, b), (b, a), (0, a), (b, 0)\}$

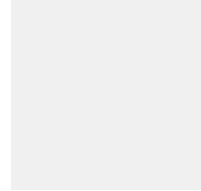
Feedback

The correct answer is: $\{(0,0), (b, a), (0, a), (b, 0)\}$

Question 11

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\lfloor \frac{3}{2} - \lceil 3 + \frac{4}{5} \rceil \rfloor$

Answer:

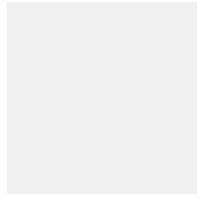
Feedback

The correct answer is: -3

Question 12

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $f \circ g(X) = aX + b$. Find $a + b$.

Answer:

39

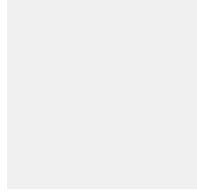
Feedback

The correct answer is: 39

Question 13

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\left\lfloor \frac{3}{2} - \left\lceil 3 + \frac{5}{4} \right\rceil \right\rfloor$

Answer:

-4

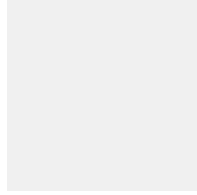
Feedback

The correct answer is: -4

Question 14

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f: \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$, $f(m, n) = n+1$. Choose correct answer:

Select one:



a. f is one-to-one but not onto

- ☐ b. f is a bijection
- ☒ c. f is onto but not one-to-one
- ☐ d. f(x) is neither one-to-one nor onto

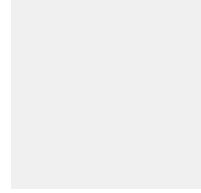
Feedback

The correct answer is: f is onto but not one-to-one

Question 15

Complete

Mark 0.00 out of 1.00



Flag question

Question text

$$\sum_{j=0}^3 \sum_{i=1}^2 (i + 2j)$$

Compute

Select one:

- ☒ a. 40
- ☐ b. Lựa chọn khác
- ☐ c. 36
- ☐ d. 24
- ☐ e. 38

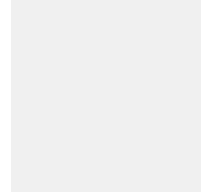
Feedback

The correct answer is: 36

Question 1

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Which compound proposition is True when $p=r= \text{True}$ and $q = \text{False}$, and is False otherwise?

Select one:

- ☐ a. $p \vee q \wedge \neg r$
- ☐ b. $p \wedge \neg q \wedge \neg r$
- ☒ c. $\neg p \wedge \neg q \wedge \neg r$
- ☐ d. $p \wedge q \wedge \neg r$
- ☐ e. $p \wedge \neg q \wedge r$

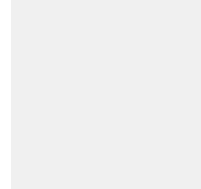
Feedback

The correct answer is: $p \wedge \neg q \wedge r$

Question 2

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Given two propositions:

p = "I went to Paris."

q = "I visit Eiffel Tower"

Which sentence on the left corresponds to the expression on the right?

Whenever I go to Paris, I visit Eiffel Tower.

Answer 1

I visit Eiffel Tower only if I go to Paris.

Answer 2

I cannot visit Eiffel Tower if I do not go to Paris.

Answer 3

I went to Paris, but I did not visit Eiffel Tower.

Answer 4

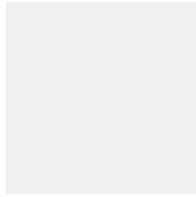
Feedback

The correct answer is: Whenever I go to Paris, I visit Eiffel Tower. $\rightarrow p \rightarrow q$, I visit Eiffel Tower only if I go to Paris. $\rightarrow q \rightarrow p$, I cannot visit Eiffel Tower if I do not go to Paris. $\rightarrow \neg p \rightarrow \neg q$, I went to Paris, but I did not visit Eiffel Tower. $\rightarrow p \wedge \neg q$

Question 3

Complete

Mark 0.33 out of 1.00



Flag question

Question text

Let p, q be two propositions. Which propositions are logically equivalent to $p \leftrightarrow q$?

$(p \vee q) \oplus (\neg p \vee \neg q)$ Answer 1

$(p \wedge q) \vee (\neg p \vee \neg q)$ Answer 2

$(p \vee q) \wedge (\neg p \vee \neg q)$ Answer 3

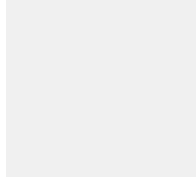
Feedback

The correct answer is: $(p \vee q) \oplus (\neg p \vee \neg q) \rightarrow$ Yes, $(p \wedge q) \vee (\neg p \vee \neg q) \rightarrow$ No, $(p \vee q) \wedge (\neg p \vee \neg q) \rightarrow$ No

Question 4

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let p, q be two propositions. Which propositions are logically equivalent to $p \oplus q$?

$(p \vee q) \oplus (\neg p \vee \neg q)$ Answer 1

$(p \vee q) \vee (\neg p \vee \neg q)$ Answer 2

$(p \vee q) \wedge (\neg p \vee \neg q)$ Answer 3

Feedback

The correct answer is: $(p \vee q) \oplus (\neg p \vee \neg q) \rightarrow$ No, $(p \vee q) \vee (\neg p \vee \neg q) \rightarrow$ No, $(p \vee q) \wedge (\neg p \vee \neg q) \rightarrow$ Yes

Question 5

Complete

Mark 1.00 out of 1.00

Flag question

Question text

Which statements are correct?

$\forall x(P(x) \wedge Q(x))$ and $\forall x P(x) \wedge \forall x Q(x)$ have the same truth values

Answer 1

True

$\forall x(P(x) \rightarrow Q(x))$ and $\forall x P(x) \rightarrow \forall x Q(x)$ have the same truth values

Answer 2

False

$\forall x(P(x) \vee Q(x))$ and $\forall x P(x) \vee \forall x Q(x)$ have the same truth values

Answer 3

False

Feedback

The correct answer is: $\forall x(P(x) \wedge Q(x))$ and $\forall x P(x) \wedge \forall x Q(x)$ have the same truth values \rightarrow True, $\forall x(P(x) \rightarrow Q(x))$ and $\forall x P(x) \rightarrow \forall x Q(x)$ have the same truth values \rightarrow False, $\forall x(P(x) \vee Q(x))$ and $\forall x P(x) \vee \forall x Q(x)$ have the same truth values \rightarrow False

Question 6

Complete

Mark 0.00 out of 1.00

Flag question

Question text

Let $E(x, y)$ = "x emails y".

Translate the sentence into logical expression, domain is all people.

"Each person has sent email to another person"

Select one:

- ☐ a. $\forall x \exists y ((x \neq y) \wedge E(x, y))$

- ☒ b. $\forall x \exists y ((x \neq y) \wedge E(y, x))$
- ☐ c. None of the other choices is correct
- ☐ d. $\exists x \forall y ((x \neq y) \wedge E(x, y))$
- ☐ e. $\exists x \forall y ((x \neq y) \wedge E(x, y))$

Feedback

The correct answer is: $\forall x \exists y ((x \neq y) \wedge E(x, y))$

Question 7

Complete
Mark 0.00 out of 1.00

Flag question

Question text

Given an argument:

"If Jack is a soccer player then Jack is rich. Jack is a soccer player. Therefore Jack is rich."

Choose correct statement:

Select one:

- ☒ a. This valid argument is based on modus tollens
- ☐ b. This argument is a fallacy
- ☐ c. This valid argument is based on addition rule
- ☐ d. This valid argument is based on modus ponens
- ☐ e. This valid argument is based on hypothetical syllogism

Feedback

The correct answer is: This valid argument is based on modus ponens

Question 8

Complete
Mark 1.00 out of 1.00

Flag question

Question text

Which pairs of propositions are logically equivalent?

$$\forall x \forall y P(x, y) \text{ và}$$

$$\forall y \forall x P(x, y)$$

Answer 1

Yes

$$\forall x \exists y P(x, y) \text{ và}$$

$$\exists x \forall y P(x, y)$$

Answer 2

No

$$\exists y P(x, y) \text{ và } \exists x P(x, y)$$

Answer 3

No

$$\forall x P(x, y) \text{ và } \forall y P(x, y)$$

Answer 4

No

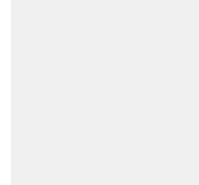
Feedback

The correct answer is: $\forall x \forall y P(x, y) \text{ và } \forall y \forall x P(x, y) \rightarrow \text{Yes}$, $\forall x \exists y P(x, y) \text{ và } \exists x \forall y P(x, y) \rightarrow \text{No}$, $\exists y P(x, y) \text{ và } \exists x P(x, y) \rightarrow \text{No}$, $\forall x P(x, y) \text{ và } \forall y P(x, y) \rightarrow \text{No}$

Question 9

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Let $A = \{1, 2, 4, 6, 7, 9, 8\}$ $B = \{3, 1, 5, 7, 6\}$. Which set has the maximum cardinality?

Select one:

- ☐ a. $A - B$
- ☒ b. $A \cap B$
- ☐ c. $B - A$

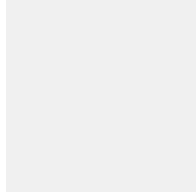
Feedback

The correct answer is: $A - B$

Question 10

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Which statement is FALSE?

Select one:

- ☐ a. $\{a\} \subseteq \{a, \{a, b\}\}$
- ☐ b. $\{a, b\} \in \{a, \{a, b\}\}$
- ☒ c. $\{a, b\} \subseteq \{a, \{a, b\}\}$
- ☐ d. $a \in \{a, \{a, b\}\}$

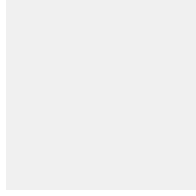
Feedback

The correct answer is: $\{a, b\} \subseteq \{a, \{a, b\}\}$

Question 11

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\lfloor \left(\frac{7}{2}\right)^2 \rfloor - \left(\lfloor \frac{7}{2} \rfloor\right)^2$

Answer:

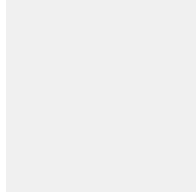
Feedback

The correct answer is: 3

Question 12

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $f \circ g(X) = aX + b$. Find $a + b$.

Answer:

39

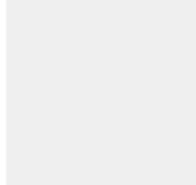
Feedback

The correct answer is: 39

Question 13

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\left\lfloor \frac{3}{2} - \left\lceil 3 + \frac{5}{4} \right\rceil \right\rfloor$

Answer:

-4

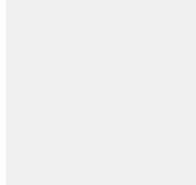
Feedback

The correct answer is: -4

Question 14

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f: \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$, $f(m, n) = n+1$. Choose correct answer:

Select one:



a. $f(x)$ is neither one-to-one nor onto

- ☒ b. f is onto but not one-to-one
- ☐ c. f is a bijection
- ☐ d. f is one-to-one but not onto

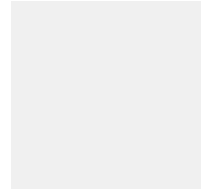
Feedback

The correct answer is: f is onto but not one-to-one

Question 15

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute

$$\sum_{i=0}^5 (2 \cdot 3^i + 3 \cdot 2^i).$$

Answer:

917

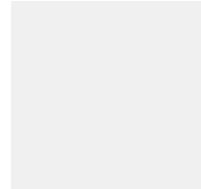
Feedback

The correct answer is: 917

Question 1

Complete

Mark 0.00 out of 1.00



Flag question

Question text

How many tuples (p, q, r, s) that make the following proposition False?

$$(\neg p \vee q \vee \neg r \vee s) \wedge (p \vee \neg q \vee \neg r \vee s)$$

Answer:

4

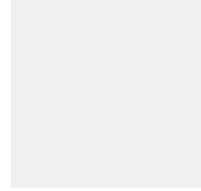
Feedback

The correct answer is: 2

Question 2

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Given two propositions:

$p = \text{"I go to Hanoi"}$

$q = \text{"I visit Sword Lake"}$

Which sentence on the left corresponds to the expression of the right?

I visit Sword Lake only if I go to Hanoi.

Answer 1

Whenever I go to Hanoi, I visit Sword Lake.

Answer 2

I went to Hanoi, but I did not visit Sword Lake.

Answer 3

I cannot visit Sword Lake if I do not go to Hanoi

Answer 4

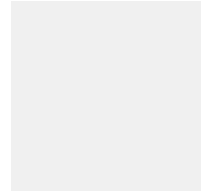
Feedback

The correct answer is: I visit Sword Lake only if I go to Hanoi. $\rightarrow q \rightarrow p$, Whenever I go to Hanoi, I visit Sword Lake. $\rightarrow p \rightarrow q$, I went to Hanoi, but I did not visit Sword Lake. $\rightarrow p \wedge \neg q$, I cannot visit Sword Lake if I do not go to Hanoi $\rightarrow \neg p \rightarrow \neg q$

Question 3

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let p, q be two propositions. Which propositions are logically equivalent to $p \rightarrow q$?

$\neg q \rightarrow p$ Answer 1

$\neg q \rightarrow \neg p$ Answer 2

$\neg p \rightarrow \neg q$ Answer 3

$\neg p \rightarrow q$ Answer 4

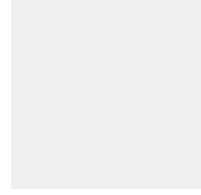
Feedback

The correct answer is: $\neg q \rightarrow p \rightarrow$ No, $\neg q \rightarrow \neg p \rightarrow$ Yes, $\neg p \rightarrow \neg q \rightarrow$ No, $\neg p \rightarrow q \rightarrow$ No

Question 4

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Which propositions are tautology?

$(p \vee q) \rightarrow (p \rightarrow q)$ Answer 1

$(p \vee r) \wedge (\neg p \vee q) \rightarrow (q \vee r)$ Answer 2

$(p \wedge q) \rightarrow p$ Answer 3

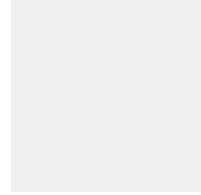
Feedback

The correct answer is: $(p \vee q) \rightarrow (p \rightarrow q) \rightarrow$ No, $(p \vee r) \wedge (\neg p \vee q) \rightarrow (q \vee r) \rightarrow$ Yes, $(p \wedge q) \rightarrow p \rightarrow$ Yes

Question 5

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $P(x)$ be a propositional function with domain $\{-1, 0, 1\}$

Which proposition on the left has the same truth value as the proposition on the right?

$\forall x((x \neq 1) \rightarrow \neg P(x))$ Answer 1

$$\exists x((x \neq 1) \wedge P(x))$$

Answer 2

$$\exists x \neg P(x)$$

Answer 3

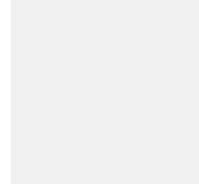
Feedback

The correct answer is: $\forall x((x \neq 1) \rightarrow \neg P(x)) \rightarrow \neg P(-1) \wedge \neg P(0), \exists x((x \neq 1) \wedge P(x)) \rightarrow P(-1) \vee P(0), \exists x \neg P(x) \rightarrow \neg P(-1) \vee \neg P(0) \vee \neg P(1)$

Question 6

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Translate the logical expression into sentence, domain is all real numbers

$$\forall x \forall y(((x < 0) \wedge (y < 0)) \rightarrow (xy > 0))$$

Select one:

- ☐ a. There is a negative number x and there is a negative number y such that xy is positive
- ☒ b. The product of two negative numbers is positive
- ☐ c. The product of two negative numbers is negative
- ☐ d. For each negative number x there is a negative number y such that xy is positive

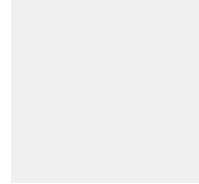
Feedback

The correct answer is: The product of two negative numbers is positive

Question 7

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Given the hypotheses:

- I work hard or I am smart
- I am not smart
- If I work hard then I will pass the exam
- If I am lucky then I will pass the exam

Which statement can be deduced from the above hypotheses?

Select one:

- ☐ a. I work hard and I am lucky
- ☐ b. I work hard and I pass the exam
- ☐ c. I work hard and I pass the exam and I am lucky
- ☒ d. None of the other choices is correct

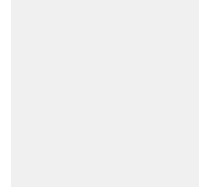
Feedback

The correct answer is: I work hard and I pass the exam

Question 8

Complete

Mark 0.50 out of 1.00



Flag question

Question text

Which propositions are true, where domain is the set of all integers?

$$\forall x \exists y (xy = 3)$$

Answer 1

No

$$\forall x \exists y (x = y^{1/2})$$

Answer 2

No

$$\forall x \forall y ((x^2 = y^2) \rightarrow (|x| = |y|))$$

Answer 3

No

$$\forall x \exists y (x - y^2 > 100)$$

Answer 4

Yes

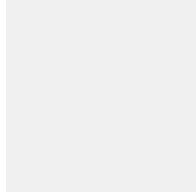
Feedback

The correct answer is: $\forall x \exists y (xy = 3) \rightarrow$ No, $\forall x \exists y (x = y^{1/2}) \rightarrow$ No, $\forall x \forall y ((x^2 = y^2) \rightarrow (|x| = |y|)) \rightarrow$ Yes, $\forall x \exists y (x - y^2 > 100) \rightarrow$ No

Question 9

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Which statements are FALSE? (A, B are sets)

Select one:

- ☐ a. $A \cup B = B \cup A$
- ☒ b. $A - B = B - A$
- ☐ c. $A \cap B = B \cap A$
- ☐ d. $A \oplus B = B \oplus A$

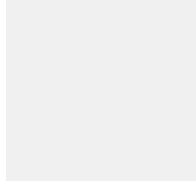
Feedback

The correct answer is: $A - B = B - A$

Question 10

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Let $A \times B = \emptyset$. Choose the best answer.

Select one:

- ☐ a. Either A or B is empty set
- ☒ b. Both A and B are empty sets
- ☐ c. $A \cap B = \emptyset$

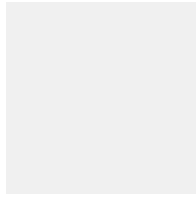
Feedback

The correct answer is: Either A or B is empty set

Question 11

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $f \circ g(X) = aX + b$. Find $a - b$.

Answer:

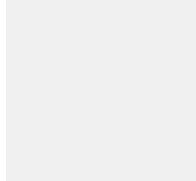
Feedback

The correct answer is: 1

Question 12

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $f \circ g(X) = aX + b$. Find $a + b$.

Answer:

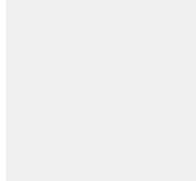
Feedback

The correct answer is: 39

Question 13

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\left\lfloor \frac{3}{2} - \left\lceil 3 + \frac{5}{4} \right\rceil \right\rfloor$

Answer:

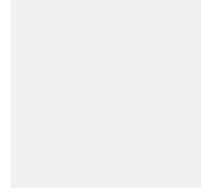
Feedback

The correct answer is: -4

Question 14

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f: \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$, $f(m, n) = n+1$. Choose correct answer:

Select one:

- ☐ a. f is a bijection
- ☒ b. f is onto but not one-to-one
- ☐ c. f is one-to-one but not onto
- ☐ d. $f(x)$ is neither one-to-one nor onto

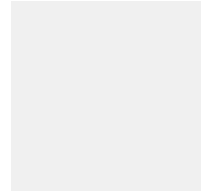
Feedback

The correct answer is: f is onto but not one-to-one

Question 15

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute

$$\sum_{i=5}^{10} (2^{i+1} - 2^i).$$

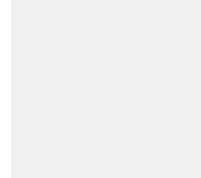
Answer:

Feedback

The correct answer is: 2016

Question 1

Complete
Mark 0.25 out of 1.00



Flag question

Question text

Which of the following propositions are negation of $p \leftrightarrow q$?

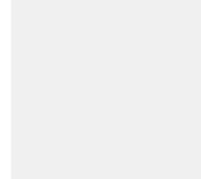
- $\neg p \leftrightarrow \neg q$ Answer 1
- $p \leftrightarrow \neg q$ Answer 2
- $\neg p \leftrightarrow q$ Answer 3
- $\neg q \leftrightarrow \neg p$ Answer 4

Feedback

The correct answer is: $\neg p \leftrightarrow \neg q \rightarrow$ No, $p \leftrightarrow \neg q \rightarrow$ Yes, $\neg p \leftrightarrow q \rightarrow$ Yes, $\neg q \leftrightarrow \neg p \rightarrow$ No

Question 2

Complete
Mark 1.00 out of 1.00



Flag question

Question text

Let p , q and r be propositions:

p : You go to class regularly

q : You do all homework problems

r : You receive good grades

Translate the sentence into logical expression:

" You receive good grades if and only if you go to class regularly and doing all homework problems".

Select one:

- ☐ a. $r \rightarrow (p \wedge q)$
- ☐ b. $(p \vee q) \rightarrow r$

- ☐ c. $(p \wedge q) \rightarrow r$
- ☒ d. $r \leftrightarrow (p \wedge q)$

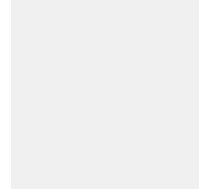
Feedback

The correct answer is: $r \leftrightarrow (p \wedge q)$

Question 3

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Which propositions are logically equivalent to $p \leftrightarrow q$?

- $\neg q \leftrightarrow \neg p$ Answer 1
- $\neg p \leftrightarrow \neg q$ Answer 2
- $p \leftrightarrow \neg q$ Answer 3
- $\neg p \leftrightarrow q$ Answer 4

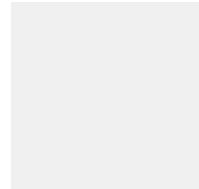
Feedback

The correct answer is: $\neg q \leftrightarrow \neg p \rightarrow$ Yes, $\neg p \leftrightarrow \neg q \rightarrow$ Yes, $p \leftrightarrow \neg q \rightarrow$ No, $\neg p \leftrightarrow q \rightarrow$ No

Question 4

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let p, q be two propositions. Which propositions are logically equivalent to $p \oplus q$?

- $(p \vee q) \oplus (\neg p \vee \neg q)$ Answer 1
- $(p \vee q) \vee (\neg p \vee \neg q)$ Answer 2

$(p \vee q) \wedge (\neg p \vee \neg q)$ Answer 3

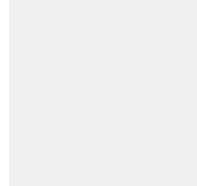
Feedback

The correct answer is: $(p \vee q) \oplus (\neg p \vee \neg q) \rightarrow$ No, $(p \vee q) \vee (\neg p \vee \neg q) \rightarrow$ No, $(p \vee q) \wedge (\neg p \vee \neg q) \rightarrow$ Yes

Question 5

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $P(x)$ be a propositional function with domain $\{-1, 0, 1\}$

Which proposition on the left has the same truth value as the proposition on the right?

$\forall x P(x)$

Answer 1

$\exists x P(x) \wedge \forall x ((x \neq 0) \rightarrow \neg P(x))$

Answer 2

$\forall x ((x \neq 0) \rightarrow P(x)) \wedge \exists x \neg P(x)$

Answer 3

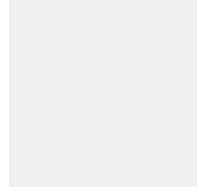
Feedback

The correct answer is: $\forall x P(x) \rightarrow$ P(-1)^P(0)^P(1), $\exists x P(x) \wedge \forall x ((x \neq 0) \rightarrow \neg P(x)) \rightarrow$ ¬P(-1)^P(0)^¬P(1), $\forall x ((x \neq 0) \rightarrow P(x)) \wedge \exists x \neg P(x) \rightarrow$ P(-1)^¬P(0)^P(1)

Question 6

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Let:

$P(x)$ = "x is 20 minutes late in the final exam"

$Q(x)$ = "x is absent for more than 20% of lectures"

$R(x)$ = "x is not eligible to take the final exam"

Translate the sentence into logical expression, domain is the set of all students in class

"Students who are not eligible to take final exams are those who is absent for more than 20% of lectures or is 20 minutes late in the final exam"

Select one:

- ☐ a. $\forall x(R(x) \leftrightarrow (Q(x) \wedge P(x)))$
- ☐ b. None of the other choices is correct
- ☒ c. $\forall x((Q(x) \wedge P(x)) \rightarrow R(x))$
- ☐ d. $\forall x(R(x) \rightarrow (Q(x) \wedge P(x)))$
- ☐ e. $\forall x(R(x) \leftrightarrow (Q(x) \vee P(x)))$

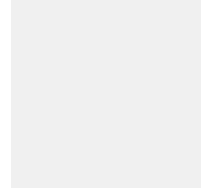
Feedback

The correct answer is: $\forall x(R(x) \leftrightarrow (Q(x) \vee P(x)))$

Question 7

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Recall two fallacies:

(I) $[(p \rightarrow q) \wedge q] \rightarrow p$

(II) $[(p \rightarrow q) \wedge \neg p] \rightarrow \neg q$

Given the statement:

"In a right triangle, the sum of three angles is 180°. Let ABC be any triangle. The sum of three angles of ABC is 180°, therefore ABC is right triangle"

Choose correct statement:

Select one:

- ☒ a. This is a fallacy of type (I)
- ☐ b. This is a valid argument
- ☐ c. This is a fallacy of type (II)

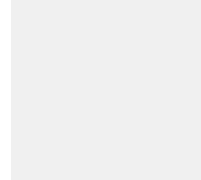
Feedback

The correct answer is: This is a fallacy of type (I)

Question 8

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Find the negation of

$$\forall x \forall y (\exists z \neg T(x, y, z) \wedge Q(x, y))$$

Select one:

- ☐ a. $\exists x \exists y (\forall z \neg T(x, y, z) \vee Q(x, y))$.
- ☒ b. $\exists x \exists y (\forall z T(x, y, z) \vee \neg Q(x, y))$.
- ☐ c. $\forall x \exists y (\forall z \neg T(x, y, z) \wedge \neg Q(x, y))$.
- ☐ d. $\forall x \exists y (\forall z T(x, y, z) \vee Q(x, y))$.

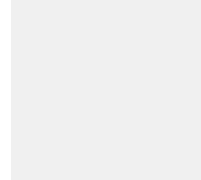
Feedback

The correct answer is: $\exists x \exists y (\forall z T(x, y, z) \vee \neg Q(x, y))$.

Question 9

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let A, B be sets. The statement

$$A \cap (B \cup \bar{A}) = A \cap B$$

is True or False?

Select one:

- ☒ True

 False

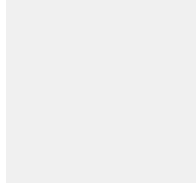
Feedback

The correct answer is 'True'.

Question 10

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Find the cardinality of the set $\{1, 2, 3, 2, 5, 6\}$

Answer:

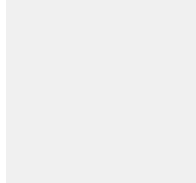
Feedback

The correct answer is: 5

Question 11

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $g \circ f(X) = aX + b$. Find b .

Answer:

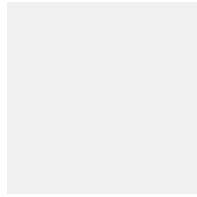
Feedback

The correct answer is: 19

Question 12

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $f \circ g(X) = aX + b$. Find $a + b$.

Answer:

39

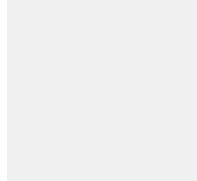
Feedback

The correct answer is: 39

Question 13

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\left\lfloor \frac{3}{2} - \left\lceil 3 + \frac{5}{4} \right\rceil \right\rfloor$

Answer:

-4

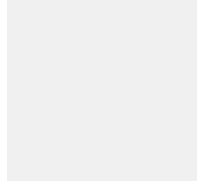
Feedback

The correct answer is: -4

Question 14

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f: \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$, $f(m, n) = n+1$. Choose correct answer:

Select one:



a. f is one-to-one but not onto

- ☐ b. $f(x)$ is neither one-to-one nor onto
- ☒ c. f is onto but not one-to-one
- ☐ d. f is a bijection

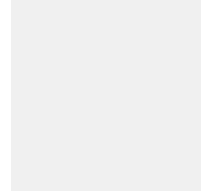
Feedback

The correct answer is: f is onto but not one-to-one

Question 15

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Given the sequence 1, 2, 2, 3, 3, 3, 4, 4, 4, 4,...

Find the 100th term.

Answer:

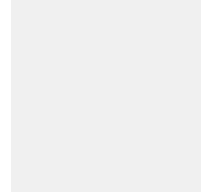
Feedback

The correct answer is: 14

Question 1

Complete

Mark 0.00 out of 1.00



Flag question

Question text

Which compound propositions is True when $p, q = \text{True}$ and $r = \text{False}$, and is False otherwise?

Select one:

- ☒ a. $p \wedge \neg q \wedge r$
- ☐ b. $p \wedge \neg q \wedge \neg r$
- ☐ c. $\neg p \wedge \neg q \wedge \neg r$
- ☐ d. $p \vee q \vee \neg r$

☒ e. $p \wedge q \wedge \neg r$

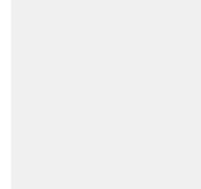
Feedback

The correct answer is: $p \wedge q \wedge \neg r$

Question 2

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let p, q be propositions:

p = "You do all homework problems"

q = "You receive good grades"

Translate the sentence into logical expression:

"Doing all homework problems is enough to receive good grades".

Select one:

- ☐ a. $q \rightarrow p$
- ☐ b. Các lựa chọn còn lại đều sai
- ☒ c. $p \rightarrow q$
- ☐ d. $p \vee q$
- ☐ e. $p \wedge q$

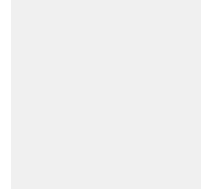
Feedback

The correct answer is: $p \rightarrow q$

Question 3

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let p, q be two propositions. Which propositions are logically equivalent to $p \leftrightarrow q$?

$(p \vee q) \wedge (\neg p \vee \neg q)$ Answer 1

$(p \wedge q) \vee (\neg p \vee \neg q)$ Answer 2

$(p \vee q) \oplus (\neg p \vee \neg q)$ Answer 3

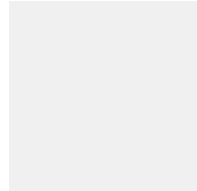
Feedback

The correct answer is: $(p \vee q) \wedge (\neg p \vee \neg q) \rightarrow$ No, $(p \wedge q) \vee (\neg p \vee \neg q) \rightarrow$ No, $(p \vee q) \oplus (\neg p \vee \neg q) \rightarrow$ Yes

Question 4

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Which propositions are contradiction?

$[(p \rightarrow q) \vee (q \rightarrow p)] \wedge (p \oplus q)$ Answer 1

$(p \rightarrow q) \vee (q \rightarrow p) \vee (p \oplus q)$ Answer 2

$(p \rightarrow q) \wedge (q \rightarrow p) \wedge (p \oplus q)$ Answer 3

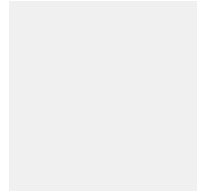
Feedback

The correct answer is: $[(p \rightarrow q) \vee (q \rightarrow p)] \wedge (p \oplus q) \rightarrow$ No, $(p \rightarrow q) \vee (q \rightarrow p) \vee (p \oplus q) \rightarrow$ No, $(p \rightarrow q) \wedge (q \rightarrow p) \wedge (p \oplus q) \rightarrow$ Yes

Question 5

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Which statements are correct?

$\forall x (P(x) \vee Q(x))$ and $\forall x P(x) \vee \forall x Q(x)$ have the same

Answer 1

truth values

$\forall x(P(x) \wedge Q(x))$ and $\forall x P(x) \wedge \forall x Q(x)$ have the same

False

truth values

$\forall x(P(x) \rightarrow Q(x))$ and $\forall x P(x) \rightarrow \forall x Q(x)$ have the same

Answer 2

True

Answer 3

False

truth values

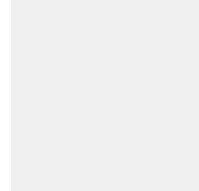
Feedback

The correct answer is: $\forall x(P(x) \vee Q(x))$ and $\forall x P(x) \vee \forall x Q(x)$ have the same truth values \rightarrow False, $\forall x(P(x) \wedge Q(x))$ and $\forall x P(x) \wedge \forall x Q(x)$ have the same truth values \rightarrow True, $\forall x(P(x) \rightarrow Q(x))$ and $\forall x P(x) \rightarrow \forall x Q(x)$ have the same truth values \rightarrow False

Question 6

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let:

$P(x)$ = "x can swim"

$Q(x)$ = "x is healthy"

Match the proposition on the left with the sentence on the right

$\exists x(P(x) \wedge \neg Q(x))$ Answer 1

$\forall x(Q(x) \rightarrow P(x))$ Answer 2

$\forall x(P(x) \rightarrow Q(x))$ Answer 3

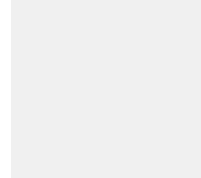
$\exists x(\neg P(x) \wedge Q(x))$ Answer 4

Feedback

The correct answer is: $\exists x(P(x) \wedge \neg Q(x)) \rightarrow$ Some one can swim but is not healthy, $\forall x(Q(x) \rightarrow P(x)) \rightarrow$ Any healthy person can swim, $\forall x(P(x) \rightarrow Q(x)) \rightarrow$ Any one who can swim is healthy, $\exists x(\neg P(x) \wedge Q(x)) \rightarrow$ Some one can not swim but is healthy

Question 7

Complete
Mark 0.00 out of 1.00



Flag question

Question text

Given the hypotheses:

- If I am lucky then I will pass the exam
- If I do all homework problems then I will pass the exam
- I passed the exam.

Which statement can be deduced from the above hypotheses?

Select one:

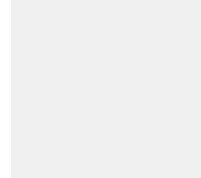
- ☒ a. I do all homework problems and I am lucky
- ☐ b. None of the other choices is correct
- ☐ c. I am lucky
- ☐ d. I do all homework problems

Feedback

The correct answer is: None of the other choices is correct

Question 8

Complete
Mark 1.00 out of 1.00



Flag question

Question text

Find the negation of

$\exists x \exists y (\forall z T(x, y, z) \vee Q(x, y))$?

Select one:

- ☐ a. $\forall x \forall y (\exists z \neg T(x, y, z) \vee \neg Q(x, y))$
- ☐ b. $\forall x \forall y (\exists z T(x, y, z) \wedge Q(x, y))$

- ☐ c. $\forall x \exists y (\forall z \neg T(x, y, z) \wedge \neg Q(x, y))$
- ☒ d. $\forall x \forall y (\exists z \neg T(x, y, z) \wedge \neg Q(x, y))$

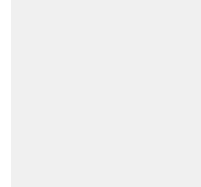
Feedback

The correct answer is: $\forall x \forall y (\exists z \neg T(x, y, z) \wedge \neg Q(x, y))$

Question 9

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let A, B be sets. Which statements do NOT imply that A = B?

Select one:

- ☒ a. $A \cap B = \emptyset$
- ☐ b. $A \cup B = \emptyset$
- ☐ c. $A \oplus B = \emptyset$

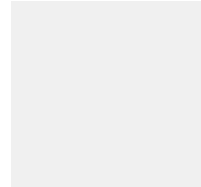
Feedback

The correct answer is: $A \cap B = \emptyset$

Question 10

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let A={0, a}, B={0, b}. Determine B x A.

Select one:

- ☒ a. $\{(0,0), (b, a), (0, a), (b, 0)\}$
- ☐ b. $\{(0,0), (0, b), (a, 0), (a, b)\}$
- ☐ c. $\{(0,0), (a, b)\}$
- ☐ d. $\{(0,0), (0, b), (a, 0), (a, b), (b, a), (0, a), (b, 0)\}$

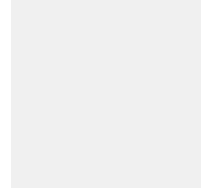
Feedback

The correct answer is: $\{(0,0), (b, a), (0, a), (b, 0)\}$

Question 11

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\lfloor \frac{3}{2} + \lceil 3 + \frac{4}{5} \rceil \rfloor$

Answer:

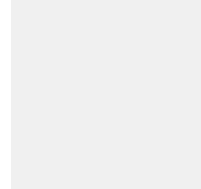
Feedback

The correct answer is: 5

Question 12

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f(X) = 5X + 4$, $g(X) = 4X + 3$. Suppose that $f \circ g(X) = aX + b$. Find $a + b$.

Answer:

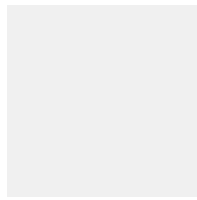
Feedback

The correct answer is: 39

Question 13

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute $\lfloor \frac{3}{2} - \lceil 3 + \frac{5}{4} \rceil \rfloor$

Answer:

-4

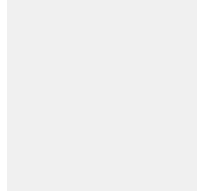
Feedback

The correct answer is: -4

Question 14

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Let $f: \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$, $f(m, n) = n+1$. Choose correct answer:

Select one:

- ☒ a. f is onto but not one-to-one
- ☐ b. f is one-to-one but not onto
- ☐ c. f is a bijection
- ☐ d. $f(x)$ is neither one-to-one nor onto

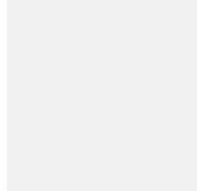
Feedback

The correct answer is: f is onto but not one-to-one

Question 15

Complete

Mark 1.00 out of 1.00



Flag question

Question text

Compute

$$\sum_{i=0}^{10} (1 + (-1)^i).$$

Answer:

Feedback

The correct answer is: 12