

## Discrete Mathematics (1) - All sections

### Question 8

Answer saved  
Marked out of 3.00  
Flag question

Let domain of  $\{m\}$  include all students.  $\{P(m)\}$  be the statement "m spends more than 2 hours in playing polo". Express  $\{(\forall m \neg P(m))\}$  quantification in English.

- a) A student is there who spends more than 2 hours in playing polo
- b) There is a student who does not spend more than 2 hours in playing polo
- c) All students spends more than 2 hours in playing polo
- d) No student spends more than 2 hours in playing polo

Answer:

c

Quiz navigation



Finish attempt...

Time left 0:12:38

PREVIOUS PAGE

FINISH ATTEMPT...

OneDrive

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PSUTE-LEARNING

**Started on** Saturday, 27 March 2021, 5:26 PM  
**State** Finished  
**Completed on** Saturday, 27 March 2021, 5:49 PM  
**Time taken** 21 mins 30 secs  
**Grade** 20.00 out of 20.00 (100%)

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Show one page at a time

**FINISH REVIEW**

**Question 1**

Complete  
Mark: 2.00 out of 2.00

Flag question

The inverse of the statement "if  $x$  is even, then  $x + 1$  is odd" is

Select one:

- A. If  $x + 1$  is even, then  $x$  is odd
- B. If  $x$  is odd, then  $x + 1$  is even
- C. If  $x + 1$  is odd, then  $x$  is even
- D. If  $x + 1$  is odd, then  $x$  is odd

**Question 2**

Complete  
Mark: 2.00 out of 2.00

Flag question

Which of the following statement is a proposition?

Select one:

- a. The only odd prime number is 2.
- b. What is the time now?
- c. God bless you!
- d. Get me a glass of milkshake.

**Question 3**

Complete  
Mark: 2.00 out of 2.00

Flag question

Let  $P$ : This is a great website,  $Q$ : You should not come back here. Then "This is a great website and you should come back here" is best represented by?

Select one:

- a.  $P \wedge \neg Q$
- b.  $P \vee Q$
- c.  $\neg P \vee \neg Q$
- d.  $P \wedge Q$

**Question 4**

Complete  
Mark: 3.00 out of 3.00

Flag question

Let  $p$ : you can volunteer for the army

$q$ : you are under 18

$r$ : there is an ongoing war

Express the following statement using symbols

"you can't volunteer for the army if you are under 18 unless there is an ongoing war"

Question 5

Complete  
Mark: 3.00 out of 3.00  
Flag question

Let  $m$  = "Juan is a math major,"  
 $c$  = "Juan is a computer science major,"  
 $g$  = "Juan's girlfriend is a literature major,"  
 $h$  = "Juan's girlfriend has read Hamlet," and  
 $t$  = "Juan's girlfriend has read The Tempest."

Which of the following expresses the statement "Juan is a computer science major and a math major, but his girlfriend is a literature major who hasn't read both The Tempest and Hamlet."

Select one:

- A.  $c \wedge m \wedge g \wedge (h \vee t)$
- B.  $c \wedge m \wedge g \wedge (\neg h \wedge \neg t)$
- C.  $c \wedge m \wedge (g \vee (\neg h \wedge \neg t))$
- D.  $c \wedge m \wedge (g \vee (\neg h \vee \neg t))$
- E.  $c \wedge m \wedge g \wedge (\neg h \vee \neg t)$

Question 6

Complete  
Mark: 3.00 out of 3.00  
Flag question

Let  $p$ : I will pay my taxes

$q$ : paying my taxes

$r$ : I will go to jail.

Express the following statement using symbols

"I will pay my taxes only if me paying my taxes is necessary for me not going to jail"

Select one:

- a.  $p \rightarrow (\neg q \rightarrow r)$
- b.  $\neg p \rightarrow (\neg q \rightarrow \neg r)$
- c.  $p \rightarrow (\neg r \rightarrow q)$
- d.  $(p \rightarrow \neg q) \rightarrow \neg r$

Question 7

Complete  
Mark: 2.00 out of 2.00  
Flag question

The converse of the conditional statement "If it snows today, then I will ski tomorrow" is "If I ski tomorrow, then it will snow today".

Select one:

- True
- False

PSUTE-LEARNING

6  
Complete  
Mark 3.00 out of 3.00  
Flag question

Let  $p$ : I will pay my taxes.  
 $q$ : paying my taxes.  
 $r$ : I will go to jail.  
Express the following statement using symbols.  
"I will pay my taxes only if me paying my taxes is necessary for me not going to jail"

Select one:

- a.  $p \rightarrow (\neg q \rightarrow r)$
- b.  $\neg p \rightarrow (\neg q \rightarrow \neg r)$
- c.  $p \rightarrow (\neg r \rightarrow q)$
- d.  $(p \rightarrow \neg q) \rightarrow \neg r$

Question 7  
Complete  
Mark 2.00 out of 2.00  
Flag question

The converse of the conditional statement "If it snows today, then I will ski tomorrow" is "If I ski tomorrow, then it will snow today".

Select one:

- True
- False

Question 8  
Complete  
Mark 3.00 out of 3.00  
Flag question

Let domain of  $m$  includes all students,  $P(m)$  be the statement "m spends more than 2 hours in playing polo". Express  $\exists m, P(m)$  quantification in English.

- a) A student is there who spends more than 2 hours in playing polo
- b) There is a student who does not spend more than 2 hours in playing polo
- c) All students spends more than 2 hours in playing polo
- d) No student spends more than 2 hours in playing polo

Answer:

FINISH REVIEW

Let  $m$  = "Juan is a math major,"  
 $c$  = "Juan is a computer science major,"  
 $g$  = "Juan's girlfriend is a literature major,"  
 $h$  = "Juan's girlfriend has read Hamlet," and  
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Which of the following expresses the statement "Juan is a computer science major and a math major, but his girlfriend is a literature major who hasn't read both The Tempest and Hamlet."

Select one:

- A.  $c \wedge m \wedge g \wedge (h \vee t)$
- B.  $c \wedge m \wedge g \wedge (\sim h \wedge \sim t)$
- C.  $c \wedge m \wedge (g \vee (\sim h \wedge \sim t))$
- D.  $c \wedge m \wedge (g \vee (\sim h \vee \sim t))$
- E.  $c \wedge m \wedge g \wedge (\sim h \vee \sim t)$

[Clear my choice](#)

## Discrete Mathematics (1) - All sections

### Question 1

Answer saved  
Marked out of 2.00

Flag question

The inverse of the statement "If  $x$  is even, then  $x + 1$  is odd" is

Select one:

- A. If  $x + 1$  is even, then  $x$  is odd
- B. If  $x$  is odd, then  $x + 1$  is even
- C. If  $x + 1$  is odd, then  $x$  is even
- D. If  $x + 1$  is odd, then  $x$  is odd

[Clear my choice](#)

Quiz navigation



[Finish attempt...](#)

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HW2

Let  $F(x, y)$  be the statement "x can fool y," where the domain consists of all people in the world. Use quantifiers to express each of these statements.

5. **Value: 0.24 points** Required information

Everybody can fool Fred.

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

[Hints](#)

[Hint #1](#)

[Check my work](#)

6. **Value: 0.24 points** Required information

There is no one who can fool everybody.

$\forall x \neg \forall y (F(x, y))$   
  $\exists x \neg \exists y (F(x, y))$   
  $\exists x \forall y (F(x, y))$

HW2

ezto.mheducation.com/hm.tpx

Discrete Mathematics 1 Spring 2021, Dr. DarAssi

Mohammad Khawaja

Discrete Mathematics 11-12

HW2 instructions | help

Questions 5 - 7 (of 41)

Save & Exit Submit

Let  $F(x, y)$  be the statement "x can fool y," where the domain consists of all people in the world. Use quantifiers to express each of these statements.

5. **Value: 0.24 points** Required information

Everybody can fool Fred.

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

[Hints](#)

[Hint #1](#)

[Check my work](#)

6. **Value: 0.24 points** Required information

There is no one who can fool everybody.

$\forall x \neg \forall y (F(x, y))$   
  $\exists x \neg \exists y (F(x, y))$   
  $\exists x \forall y (F(x, y))$

PSUT E-LEARNING

$p \wedge (q \wedge r) \equiv (p \wedge q) \wedge r$

*Distributive laws:*  $p \vee (q \wedge r) \equiv (p \vee q) \wedge (p \vee r)$ ,  
 $p \wedge (q \vee r) \equiv (p \wedge q) \vee (p \wedge r)$

*Absorption laws:*  $p \vee (p \wedge q) \equiv p$ ,  $p \wedge (p \vee q) \equiv p$

*DeMorgan's laws:*  $\neg(p \vee q) \equiv \neg p \wedge \neg q$ ,  
 $\neg(p \wedge q) \equiv \neg p \vee \neg q$

1.  $p \rightarrow q \equiv \neg p \vee q$
2.  $p \rightarrow q \equiv \neg q \rightarrow \neg p$
3.  $p \vee q \equiv \neg p \rightarrow q$
4.  $p \wedge q \equiv \neg(p \rightarrow \neg q)$
5.  $\neg(p \rightarrow q) \equiv p \wedge \neg q$
6.  $(p \rightarrow q) \wedge (p \rightarrow r) \equiv p \rightarrow (q \wedge r)$
7.  $(p \rightarrow r) \wedge (q \rightarrow r) \equiv (p \vee q) \rightarrow r$
8.  $(p \rightarrow q) \vee (p \rightarrow r) \equiv p \rightarrow (q \vee r)$
9.  $(p \rightarrow r) \vee (q \rightarrow r) \equiv (p \wedge q) \rightarrow r$
10.  $p \leftrightarrow q \equiv (p \rightarrow q) \wedge (q \rightarrow p)$
11.  $p \leftrightarrow q \equiv \neg p \leftrightarrow \neg q$
12.  $p \leftrightarrow q \equiv (p \wedge q) \vee (\neg p \wedge \neg q)$
13.  $\neg(p \leftrightarrow q) \equiv p \leftrightarrow \neg q$

$\therefore p \wedge q$  (Conjunction)

---

$p$   
 $p \rightarrow q$   
 -----  
 $\therefore q$  (Modus ponens)

---

$\neg q$   
 $p \rightarrow q$   
 -----  
 $\therefore \neg p$  (Modus tollens)

---

$p \rightarrow q$   
 $q \rightarrow r$   
 -----  
 $\therefore p \rightarrow r$  (Hypothetical syllogism)

---

$p \vee q$   
 $\neg p$   
 -----  
 $\therefore q$  (Disjunctive syllogism)

---

$p \vee q$   
 $\neg p \vee r$   
 -----  
 $\therefore q \vee r$  (Resolution)



# Discrete Mathematics (1) - All sections

Information  
Flag question

## EQUIVALENCES AND IMPLICATION EQUIVALENCES

*Double negation law:*  $\neg(\neg p) \equiv p$   
*Identity laws:*  $p \vee \mathbf{F} \equiv p$ ,  $p \wedge \mathbf{T} \equiv p$   
*Domination laws:*  $p \vee \mathbf{T} \equiv \mathbf{T}$ ,  $p \wedge \mathbf{F} \equiv \mathbf{F}$   
*Negation laws:*  $p \vee \neg p \equiv \mathbf{T}$ ,  $p \wedge \neg p \equiv \mathbf{F}$   
*Idempotent laws:*  $p \vee p \equiv p$ ,  $p \wedge p \equiv p$   
*Commutative laws:*  $p \vee q \equiv q \vee p$ ,  $p \wedge q \equiv q \wedge p$   
*Associative laws:*  $p \vee (q \vee r) \equiv (p \vee q) \vee r$ ,  
 $p \wedge (q \wedge r) \equiv (p \wedge q) \wedge r$   
*Distributive laws:*  $p \vee (q \wedge r) \equiv (p \vee q) \wedge (p \vee r)$ ,  
 $p \wedge (q \vee r) \equiv (p \wedge q) \vee (p \wedge r)$   
*Absorption laws:*  $p \vee (p \wedge q) \equiv p$ ,  $p \wedge (p \vee q) \equiv p$   
*DeMorgan's laws:*  $\neg(p \vee q) \equiv \neg p \wedge \neg q$ ,  
 $\neg(p \wedge q) \equiv \neg p \vee \neg q$

- $p \rightarrow q \equiv \neg p \vee q$
- $p \rightarrow q \equiv \neg q \rightarrow \neg p$
- $p \vee q \equiv \neg p \rightarrow q$

## RULES OF INFERENCE

$p$   
-----  
 $\therefore p \vee q$  (*Addition*)

---

$p \wedge q$   
-----  
 $\therefore p$  (*Simplification*)

---

$p$   
 $q$   
-----  
 $\therefore p \wedge q$  (*Conjunction*)

---

$p$   
 $p \rightarrow q$   
-----  
 $\therefore q$  (*Modus ponens*)

---

$\neg q$   
 $p \rightarrow q$   
-----  
 $\therefore \neg p$  (*Modus tollens*)

---

$p \rightarrow q$   
 $q \rightarrow r$   
-----  
 $\therefore p \rightarrow r$  (*Hypothetical syllogism*)

---

$p \vee q$

Quiz navigation

Rules

New heading  
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 10  11  12  13  14  15

Finish attempt ...

Time left 0:59:28

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# Discrete Mathematics (1) - All sections



**Question 1**  
Not yet answered  
Marked out of 2.00  
Flag question

Let  $p$  and  $q$  be the propositions  
 $p$ : You drive over 65 miles per hour.  
 $q$ : You get a speeding ticket.

Identify the expression that represents the proposition "Driving over 65 miles per hour is necessary and sufficient for getting a speeding ticket" using  $p$  and  $q$  and logical connectives (including negations).

- Select one:
- a.  $p \vee q$
  - b.  $q \rightarrow p$
  - c.  $p \leftrightarrow q$
  - d.  $p \rightarrow q$

[Clear my choice](#)

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Quiz navigation

Rules  
**1**

New heading

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Finish attempt ...

Time left **0:56:30**

To show that if  $x \in \mathbb{Z}$  and  $x^2 - 6x + 5$  is an even integer then  $x$  is an odd integer. You will apply the

method by assuming  $x$  is

and  $x^2 - 6x + 5$  is

PSUT E-LEARNING

- $\sim r$

Then the valid conclusion is

m

Question 12

Complete  
Mark 0.67 out of 2.00  
Flag question

To show that if  $x \in \mathbb{Z}$  and  $x^2 - 6x + 5$  is an even integer then  $x$  is an odd integer. You will apply the

contraposition

method by assuming  $x$  is

even

and  $x^2 - 6x + 5$  is

odd

Question 13

Complete  
Mark 2.00 out of 2.00  
Flag question

Consider the following premises:

- $p \vee q$
- $q \rightarrow r$
- $p \rightarrow m$
- $\sim m$

Then the valid conclusion is

PSUT E-LEARNING

"Alice is a mathematics major. Therefore, Alice is either a mathematics major or a computer science major".

Select one:

- a. Addition
- b. Simplification
- c. Resolution
- d. Modus tollens
- e. Hypothetical syllogism

Complete  
Mark 2.00 out of 2.00  
Flag question

Translate the statement into English, where the domain for each variable consists of all real numbers

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

Select one:

- For any two real number  $x$  and  $y$ , if  $x$  and  $y$  have opposite signs, then  $x - y$  is a positive real number.
- For any two real number  $x$  and  $y$ , if  $x - y$  is a positive real number, then  $x$  and  $y$  have opposite signs.
- For any two real number  $x$  and  $y$ , if  $x - y$  is a positive real number, then  $x$  is non-negative and  $y$  is negative.
- For any two real number  $x$  and  $y$ , if  $x$  is non-negative and  $y$  is negative, then  $x - y$  is a positive real number.

Question 15  
Complete  
Mark 2.00 out of 2.00  
Flag question

FINISH REVIEW

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PSUT E-LEARNING

- $q \rightarrow r$

- $\sim r$

Then the valid conclusion is

m

Question 12

Complete

Mark 0.67 out of 2.00

Flag question

To show that if  $x \in \mathbb{Z}$  and  $x^2 - 6x + 5$  is an even integer then  $x$  is an odd integer. You will apply the

contraposition

method by assuming  $x$  is

even

and  $x^2 - 6x + 5$  is

odd

Question 13

Complete

Mark 2.00 out of 2.00

Flag question

Consider the following premises:

- $p \vee q$

- $q \rightarrow r$

- $p \rightarrow m$

- $\sim m$

## Calculus (2) -IT - All Sections

Question 4  
Not yet answered  
Marked out of 2.00  
Flag question

For which values of  $p$  is  $\int_1^{\infty} \frac{e^{8x}}{(8 + e^{8x})^{1-p}} dx$  convergent?

- Select one:
- $p > 12$
  - $p > 3$
  - $p < 12$
  - $p < 3$
  - $p = 12$

[Clear my choice](#)

[NEXT PAGE](#)

Rakan Armoush

Quiz navigation

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Time left: 0:44:57

## Calculus (2) -IT - All Sections

Question 5

Not yet answered  
Marked out of 2.00  
Flag question

Evaluate

$$\int_0^{\pi/2} \sin(9x) \cos(7x) dx$$

1/2  
Numeric

NEXT PAGE

Rakan Armoush

Quiz navigation

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Finish attempt...

Time left: 0:38:51

## Calculus (2) -IT - All Sections

Question 6  
Not yet answered  
Marked out of 2.00  
Flag question

Consider the series  $\sum_{n=1}^{\infty} a_n$  where  $a_n = n \sin\left(\frac{3}{4n}\right)$ .

Then  $\lim_{n \rightarrow \infty} a_n =$

3/4

which implies the series is

- The series is divergent by the divergence test
- The divergence test is inconclusive

NEXT PAGE

Rakan Armoush

Quiz navigation

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Finish attempt...

Time left: 0:31:37

## Calculus (2) -IT - All Sections

### Question 12

Not yet answered  
Marked out of 2.00

Flag question

For which of the following integrals is integration by parts with  $u = x$  and  $dv = (\text{the rest of the integrand})dx$  a reasonable choice?

Select one:

$\int \frac{x}{\ln x} dx$

$\int x \cos x dx$

$\int \frac{x}{(\ln x)^3} dx$

$\int x(\ln x)^3 dx$

$\int x e^{x^2} dx$

Clear my choice

NEXT PAGE

Rakan Armoush

Quiz navigation

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Finish attempt...

Time left: 0:06:59

## Calculus (2) -IT - All Sections

### Question 13

Not yet answered  
Marked out of 3.00

Flag question

Which of the following sequences is convergent?

Select all 3 correct answers

Selecting a wrong answer will decrease your mark for this question

Select one or more:

$a_n = \frac{(-1)^n 3^n 2^n}{5^{2n}}$

$a_n = \left(\frac{n^2 - 2n}{n^2}\right)^{2n}$

$a_n = \ln n$

$a_n = n^{1/n}$

$a_n = 2 + (-1)^n$

$a_n = \frac{n^4 + 5}{n^2 + n}$

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Quiz navigation

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Finish attempt...

Time left: 0:05:06

## Calculus (2) -IT - All Sections

### Question 14

Not yet answered  
Marked out of 2.00

Flag question

To evaluate the integral  $\int \cosh^2(3x) dx$  we

Select one:

- Use the identity  $\cosh^2 x - \sinh^2 x = 1$
- Can't evaluate it because the power is even
- Use a trigonometric substitution
- Use the identity  $\cosh^2 x = \frac{1}{2}(\cosh 2x + 1)$

[Clear my choice](#)

[FINISH ATTEMPT ...](#)



Quiz navigation

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[Finish attempt ...](#)

Time left: 0:03:53