

# Prep 3 Quiz

**Due** Jan 25 at 9pm**Points** 5**Questions** 5**Time Limit** None**Allowed Attempts** Unlimited

## Instructions

## Readings

Please read the following part of the [Course Notes](#) (this includes material we covered in Week 2, but also new material for Week 3). This quiz may not ask questions about every topic covered in the readings for this week.

- Pages 27–46

## General instructions

You can review the general instructions for all prep quizzes on the [Course Syllabus](#). Remember that you can submit multiple times! You might consider printing this quiz out so that you can work on paper first.

[Take the Quiz Again](#)

## Attempt History

	Attempt	Time	Score
KEPT	<a href="#">Attempt 2</a>	1 minute	5 out of 5
LATEST	<a href="#">Attempt 2</a>	1 minute	5 out of 5
	<a href="#">Attempt 1</a>	11 minutes	4.75 out of 5

Score for this attempt: **5** out of 5

Submitted Jan 23 at 7:43pm

This attempt took 1 minute.

**Question 1****1 / 1 pts**

Let  $A(x)$  = "x is an animal" and  $U$  = the set of all living things

Select all of the statements below that can be written as  $\forall x \in U, A(x)$

Correct!

☒ All living things are animals.

☐ Some living thing is an animal.

Correct!

☒ An arbitrary living thing is an animal.

Correct!

☒ Every living thing is an animal.

☐ At least one living thing is an animal.

☐ A subset of the set of living things is an animal.

Correct!

☒ Each living thing is an animal.

## Question 2

1 / 1 pts

Fill in the blanks for each of the following statements with "for all" ( $\forall$ ) or "exists" ( $\exists$ ), so that:

- You have answered "for all" as many times as possible and
- Every statement is true

1. Let  $E(x)$  = "x is even" and  $F(x)$  = "x is a multiple of five"

exists

$x \in \mathbb{Z}, E(x) \wedge F(x)$

2. Let  $R(x)$  = "x is a real number"

for all

$x \in \mathbb{Q}, R(x)$

3, Let  $P(x)$  = "x is a prime number",  $E(x)$  = "x is even", and  $T(x)$  = "x is less than three"

for all

$$x \in \mathbb{Z}^+, (E(x) \wedge T(x)) \implies P(x)$$

Answer 1:

- Correct!
- exists
- orrect Answer
- "exists"
- orrect Answer
- exist
- orrect Answer
- "exist"
- orrect Answer
- Exists
- orrect Answer
- "Exists"
- orrect Answer
- Exist
- orrect Answer
- "Exist"

Answer 2:

- Correct!
- for all
- orrect Answer
- forall
- orrect Answer
- "forall"
- orrect Answer
- Forall
- orrect Answer
- "Forall"
- orrect Answer
- "for all"
- orrect Answer
- For all
- orrect Answer
- "For all"

Answer 3:

**Correct!**

for all

Incorrect Answer

"for all"

Incorrect Answer

forall

Incorrect Answer

"forall"

Incorrect Answer

For all

Incorrect Answer

"For all"

Incorrect Answer

Forall

Incorrect Answer

"Forall"

**Question 3****1 / 1 pts**

Select all of the true statements:

**Correct!**☒  $\forall n \in \mathbb{N}, \exists r \in \mathbb{R}, n < r$ ☐  $\exists n \in \mathbb{N}, \forall r \in \mathbb{R}, n < r$ ☐  $\forall n \in \mathbb{N}, \forall r \in \mathbb{R}, n < r$ **Correct!**☒  $\exists n \in \mathbb{N}, \exists r \in \mathbb{R}, n < r$ **Question 4****1 / 1 pts**Let  $U$  = the set of all trees

$M(x)$  = "x is a Maple tree",  $E(x)$  = "x is an evergreen tree"

Select all of the statements that are logically equivalent to:

"It is not the case that for some tree, being an evergreen implies being a maple."

Correct!

☒  $\neg(\exists x \in U, E(x) \implies M(x))$

☐  $\neg(\forall x \in U, E(x) \implies M(x))$

Correct!

☒  $\forall x \in U, \neg(E(x) \implies M(x))$

☐  $\exists x \in U, \neg(E(x) \implies M(x))$

Correct!

☒  $\forall x \in U, E(x) \wedge \neg M(x)$

☐  $\exists x \in U, E(x) \wedge \neg M(x)$

☐  $\forall x \in U, \neg M(x) \implies \neg E(x)$

☐  $\exists x \in U, \neg M(x) \implies \neg E(x)$

### Question 5

1 / 1 pts

Let  $M(n, m, p)$  = "Shelf n contains m books with p pictures in them", and  $W$  = the set of shelves.

Select the statement that is logically equivalent to the statement:

"It is not the case that all shelves contain a number of books with 165 pictures in them."

**Correct!**

☐  $\forall n \in W, \exists m \in \mathbb{N}, \neg M(n, m, 165)$

☒  $\exists n \in W, \forall m \in \mathbb{N}, \neg M(n, m, 165)$

☐  $\exists n \in W, \forall m \in \mathbb{Z}, \exists p \in \mathbb{N}, \neg M(n, m, p)$

☐  $\forall n \in W, \exists m \in \mathbb{N}, \exists p \in \mathbb{N}, \neg M(n, m, p)$

Quiz Score: **5** out of 5