Quiz 4 from Spring 2021 (Practice)

STUDENT NAME

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Q1 β-Reduction

6 Points

In the following, you will reduce each λ-expression using β-reduction.

Q1.1

3 Points

What does the λ-expression `((λx.x) (λy.y))` β-reduce to?

Enter your answer here

Save Answer

Q1.2

3 Points

What does the λ-expression `((λx.λy.x y) z w)` β-reduce to?

Enter your answer here

Save Answer

Q2 Call-by-Name versus Call-by-Value

8 Points

Recall the reduction strategies **call-by-name** and **call-by-value**. In the following, you will reduce the same λ-expression using different strategies.

Q2.1

4 Points

What does the λ-expression `((λx.λy.x) ((λz.z) w)))` reduce to using the **call-by-name** strategy? Please show all steps.

Enter your answer here

Save Answer

Q2.2
4 Points

What does the λ-expression `((λx.λy.x) ((λz.z) w)))` reduce to using the **call-by-value** strategy? Please show all steps.

Enter your answer here

Save Answer

Q3 Explicit Parentheses
2 Points

Make the parentheses in `λx. x λf. f f` explicit

Enter your answer here

Save Answer

Q4 Free Variables and Alpha Equivalence
4 Points

Q4.1
2 Points

Find the free variable(s) in `λa. (λb. b c) a b`

Enter your answer here

Save Answer

Q4.2
2 Points

Which of the following expressions are alpha equivalent to `λa. (λb. b c) a b` ?

- [ ] λx. (λb. b c) x b
- [ ] λx. (λy. y c) x y
- [ ] λa. (λb. b c) a d
- [ ] λa. (λy. y z) a b

Save Answer

Save All Answers

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