

ComS 342
Recitation 2, 10:00 Tuesday
Homework 6

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October 29, 2019

1a)

$$(((\lambda(x)(x\ x)) (\lambda(y)(y\ x)))\ z)$$

$$(((x\ x) [x \rightarrow \lambda(y)(y\ x)])\ z)$$

$$(((\lambda(y)(y\ x) \lambda(y)(y\ x)))\ z)$$

$$(((y\ x) [y \rightarrow \lambda(y)(y\ x)])\ z)$$

$$(((\lambda(y)(y\ x) x))\ z)$$

$$(((y\ x) [y \rightarrow x])\ z)$$

$$((x\ x) z)$$

1b)

$$(((\lambda(a)(\lambda(b)(a\ b))) (\lambda(c) c) x))\ y)$$

$$(((\lambda(a)(\lambda(b)(a\ b))) (c) [c \rightarrow x]))\ y)$$

$$(((\lambda(a)(\lambda(b)(a\ b))) x)\ y)$$

$$(((\lambda(b)(a\ b)) [a \rightarrow x])\ y)$$

$$((\lambda(b)(x\ b))\ y)$$

$$((x\ b) [b \rightarrow y])$$

$$(x\ y)$$

1c)

$$(((\lambda(x)(x\ x)) (\lambda(y)\ y)) (\lambda(y)\ y))$$
$$(((x\ x) [x \rightarrow \lambda(y)\ y]) (\lambda(y)\ y))$$
$$(((\lambda(y)\ y) (\lambda(y)\ y)) (\lambda(y)\ y))$$
$$((y [y \rightarrow (\lambda(y)\ y)]) (\lambda(y)\ y))$$
$$((\lambda(y)\ y) (\lambda(y)\ y))$$
$$(y [y \rightarrow (\lambda(y)\ y)])$$
$$(\lambda(y)\ y)$$

2a)

$$((\lambda(x)\ p) ((\lambda(y)(y\ y)) (\lambda(z)(z\ z))))$$
$$((p) [x \rightarrow ((\lambda(y)(y\ y)) (\lambda(z)(z\ z)))])$$
$$(p)$$

2b)

$$((\lambda(x)\ p) ((\lambda(y)(y\ y)) (\lambda(z)(z\ z))))$$
$$((\lambda(x)\ p) ((y\ y) [y \rightarrow (\lambda(z)(z\ z))]))$$
$$((\lambda(x)\ p) (((\lambda(z)(z\ z)) (\lambda(z)(z\ z)))))$$
$$((\lambda(x)\ p) (((z\ z) [z \rightarrow (\lambda(z)(z\ z))])))$$
$$((\lambda(x)\ p) ((\lambda(z)(z\ z)) (\lambda(z)(z\ z))))$$
$$((p) [x \rightarrow ((\lambda(z)(z\ z)) (\lambda(z)(z\ z)))])$$
$$(p)$$

Algorithm 1 U_{gey}

Boof
