

Question 6

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$$(\lambda g. \lambda w. g(w * \underline{(x+2)})) (\lambda x. x + \underline{w}) (\underline{y+2})$$

(a) See the blue underlines above.

$$(b) \quad (\lambda g. \lambda w. g(w * (x+2))) (\lambda x. x + w) (y+2)$$

$$= [(\lambda x. x + w) / g] (\lambda w. g(w * (x+2))) (y+2)$$

$$= (\lambda a. (\lambda b. b + w) (a * (x+2))) (y+2)$$

Rename bounded w as a .
 Rename bounded x as b

$$= [(y+2) / a] (\lambda b. b + w) (a * (x+2))$$

$$= (\lambda b. b + w) ((y+2) * (x+2))$$

$$= [(y+2) * (x+2) / b] (b + w)$$

$$= (y+2) * (x+2) + w$$