4. (2 points each–no partial credit) Suppose $\int_a^b f(x)dx = 2$ and $\int_a^b g(x)dx = 6$. Evaluate the following expressions, if possible. If the expression cannot be evaluated with what is given, simply indicate "Insufficient information." Assume that all functions are continuous on the interval $[a, b]$.

(a) $\int_a^b (g(x))^2 dx - (\int_a^b g(x)dx)^2$

Insufficient information: we are not given the value of $\int_a^b (g(x))^2 dx$.

(b) $\int_a^a (h(x))dx$

This integral is equal to 0, since the integral of any function from a point to itself is zero.

(c) $\int_{a+2}^{b+2} f(x-2)dx$

This integral is equal to 2 since it is equal to $\int_a^b f(x)dx$.

(d) $\int_a^b (f(x)g(x))dx$

Insufficient information. We do not know how to evaluate the integral of a product of two arbitrary functions.

(e) $\int_b^a (g(x))dx$

This equals $-\int_a^b g(x)dx = -6$.