8. (3 points each) Let

- $\int_a^b f(x)dx = 8$, and $\int_a^b (f(x))^2dx = 12$,
- $\int_a^b g(t)dt = 2$, and $\int_a^b (g(t))^2dt = 3$.

Evaluate the following integrals, if the value can be determined. If there is information missing, clearly state what is missing.

(a) $\int_a^b (f(x) + g(x))dx = \int_a^b f(x)dx + \int_a^b g(x)dx = 8 + 2 = \boxed{10}$

(b) $\int_a^b c f(z)dz$, for $c$ a constant $= c \int_a^b f(z)dz = \boxed{82}$

(c) $\int_a^b (f(x))^2 - g(x^2))dx = \int_a^b (f(x))^2 dx - \int_a^b g(x^2)dx$

$= 12 - \int_a^b g(x^2)dx$

But we don't know this!

9. (6 points) Find $\int_2^5 f(x)dx$, if $\int_2^5 (3f(x) + 4)dx = 18$.

Let $I = \int_2^5 f(x)dx$

$18 = \int_2^5 (3f(x) + 4)dx = \int_2^5 3f(x)dx + \int_2^5 4dx$

$= 3 \int_2^5 f(x)dx + 4(5-2) = 3I + 12$

So $I = \frac{18 - 12}{3} = \boxed{2}$. 