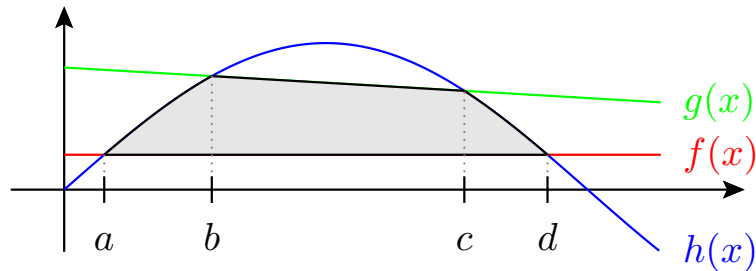


# Quiz #1

Please print your name:

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**Problem 1.** Consider the plot below. What is the area enclosed by the curves  $y = f(x)$ ,  $y = g(x)$  and  $y = h(x)$ ? Your answer should be a sum of certain integrals.



**Solution.** The area is

$$\int_a^b [h(x) - f(x)] dx + \int_b^c [g(x) - f(x)] dx + \int_c^d [h(x) - f(x)] dx.$$

**Problem 2.** Evaluate the following indefinite integral:

$$\int \cos(4t) \sin^5(4t) dt$$

**Solution.** We substitute  $u = \sin(4t)$ . Since

$$\frac{du}{dt} = 4\cos(4t),$$

we use  $\cos(4t) dt = \frac{1}{4} du$  to get

$$\int \cos(4t) \sin^5(4t) dt = \frac{1}{4} \int u^5 du = \frac{1}{24} u^6 + C = \frac{1}{24} \sin^6(4t) + C.$$