Math 2020, Winter 2007, Quiz 1

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1. Suppose that $\int_2^3 f(x)\,dx = 10$ and $\int_2^3 2f(x) - g(x)\,dx = 40$. Find $\int_2^3 g(x)\,dx$.
2. Suppose that $3 \le f(x) \le 5$ for $2 \le x \le 6$. What can you say about $\int_2^6 f(x)\,dx$?

1. $40 = \int_2^3 2f(x) - g(x)\,dx = 2\int_2^3 f(x)\,dx - \int_2^3 g(x)\,dx = 20 - \int_2^3 g(x)\,dx$

so $\boxed{\int_2^3 g(x)\,dx = 20 - 40 = -20}$

2. If $3 \le f(x) \le 5$ on $[2,6]$ then

$$\int_2^6 3\,dx \le \int_2^6 f(x)\,dx \le \int_2^6 5\,dx$$

$$3(6-2) \le \int_2^6 f(x)\,dx \le 5(6-2)$$

$$12 \le \int_2^6 f(x)\,dx \le 20.$$