Exploring Definite Integrals

On this sheet, don't just write down answers. Focus on writing out your work using correct notation. This is your chance to check your notation with us before writing out your homework!

1. Let $f(x)$ and $g(x)$ be continuous functions such that

$$\int_1^4 f(x)dx = 7, \qquad \int_2^4 f(x)dx = 5, \text{ and } \int_1^4 g(x)dx = 2.$$

Using only this information, compute the following:

(a) $\displaystyle\int_1^4 4f(x)dx$

(b) $\displaystyle\int_1^4 [g(x) - f(x)]dx$

(c) $\displaystyle\int_1^4 [8f(x) - 7g(x)]dx$

(d) $\displaystyle\int_1^2 -f(x)dx$

2. Compute the following definite integrals using the Evaluation Theorem.

(a) $\displaystyle\int_1^2 x^3 + x\,dx$

(b) $\displaystyle\int_{\pi/4}^{\pi/3} \sec^2 x\,dx$