1. Evaluate the definite integral.

(a) $\int_1^2 \frac{x^2+1}{\sqrt{x}} dx$

(b) $\int_1^8 \sqrt[3]{x}(x^2 - \sqrt{x}) dx$

(c) $\int_{-1}^2 |x - x^2| dx$

(d) $\displaystyle\int_4^9 \left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)^2 dx$

(e) $\displaystyle\int_0^1 \left(x^2 + 1 + \frac{1}{x^2+1}\right) dx$

(f) $\displaystyle\int_{\pi/2}^{\pi} \sec x \tan x \; dx$

2. If $f(3) = 12$, f' is continuous, and $\displaystyle\int_3^5 f'(x)\, dx = 20$, what is the value of $f(5)$?

3. Find the integral.

(a) $\int e^{2016x} dx$

(b) $\int_2^4 \sin(4\pi x)\ dx$

(c) $\int_0^{\pi/2} \cos^7 x \sin(2x)\ dx$

(d) $\int_0^1 x^4 e^{9x^5-8}\ dx$

(e) $\displaystyle\int \frac{15x^2+50x}{x^3+5x^2+8}dx$

(f) $\displaystyle\int \frac{dx}{x\sqrt[3]{\ln x}}$

(g) $\displaystyle\int \frac{\cos\sqrt{x}}{\sqrt{x}}dx$

(h) $\displaystyle\int_0^1 (4x^3+1)(x^4+x)^5 dx$

(i) $\int \frac{dx}{x\sqrt[3]{\ln x}}$

(j) $\int x^5 \sqrt{4+x^3}dx$

(k) $\int_0^4 \frac{x}{\sqrt{1+2x}}dx$

4. If f is continuous and $\int_0^8 f(u)du = 3$, find $\int_0^2 x^2 f(x^3)dx$ by making an appropriate substitution.