

3. Evaluate each of the following without using your calculator.

(a) $\int (x^3 - 4x^2 + 5) dx$

(b) $\int 5 \sec(x) \tan(x) dx$

(c) $\int \cos(2x) dx$

(d) $\int \frac{3}{x^4} dx$

(e) $\int 3x(x^2 - 4) dx$

(f) $\int \frac{x^4 - 3x^2 + 2x \sin(x)}{x} dx$

4. Given $\int \sec^2(x) \tan(x) dx$.

(a) Show that a general solution of this problem is $f(x) = \frac{1}{2} \tan^2(x) + C_1$.

(b) Show that a general solution of this problem is $g(x) = \frac{1}{2} \sec^2(x) + C_2$.

(c) How can there be two different solutions for this one problem? Explain.

5. Use the identity $\cos(2x) = \cos^2(x) - \sin^2(x) = 2\cos^2(x) - 1 = 1 - 2\sin^2(x)$ to find each of the following antiderivatives.

(a) $\int \cos^2(x) dx$

(b) $\int \sin^2(x) dx$

