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1. Determine the following antiderivatives.

(a) $\int (6x^3 - 5\sqrt[4]{x} + 4) dx$

(e) $\int e^z(e^{-z} + 1) dz$

(b) $\int (x + 1)(2x + 1) dx$

(f) $\int 2 \cos(3t + 1) dt$

(c) $\int \frac{5 - 4x^3 + 2x^6}{x^7} dx$

(g) $\int \frac{dx}{3 - 4x}$

(d) $\int \frac{1 - z}{\sqrt{z}} dz$

(h) $\int \frac{3x}{(1 + x^2)^3} dx$

2. (a) Express the area under the curve $y = \sqrt[3]{x+1}$ between $x = 0$ and $x = 7$ as the limit of a Riemann sum.

(b) Rewrite your answer to part (a) as a definite integral, and evaluate this integral.

3. Evaluate the following definite integrals.

(a) $\int_1^2 \left(\frac{3}{4x^2} - \frac{x^2}{2} \right) dx$

(c) $\int_{-1/2}^1 e^{2x+1} dx$

(b) $\int_0^1 \frac{4}{t^2+1} dt$

(d) $\int_1^4 \sqrt{z}(1+2z) dz$.