

Problem 1: Integrate the following functions:

(a) $\int \frac{\sqrt{x^2 - 4}}{x^3} dx$

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

(b) $\int x^3 \sqrt{x^2 + 9} dx$

(l) $\int \frac{4x^3}{\sqrt{x^2 + 1}} dx$

(c) $\int \frac{dx}{x^2 + 9}$

(m) $\int \frac{dx}{\sqrt{9x^2 + 6x - 8}}$

(d) $\int \frac{x^3}{\sqrt{x^2 - 36}} dx$

(n) $\int \frac{dx}{x\sqrt{4x^2 + 9}}$

(e) $\int \frac{x^5}{\sqrt{2 + x^2}} dx$

(o) $\int_0^1 x^3 \sqrt{1 - x^2} dx$

(f) $\int \sqrt{3x^2 - 1} dx$

(p) $\int_0^{\sqrt{3}/2} \frac{dx}{(1 - x^2)^{5/2}}$

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

(q) $\int x\sqrt{1 - x^4} dx$

(h) $\int \sqrt{9 - 3x^2} dx$

(r) $\int e^x \sqrt{1 - e^{2x}} dx$

(i) $\int \frac{\sqrt{4 - x^2}}{x^4} dx$

(s) $\int e^{2x} \sqrt{1 - e^{2x}} dx$

(j) $\int \frac{x}{(25 - x^2)^{3/2}} dx$

(t) $\int x \arcsin x dx$