

Compute the following integrals

$$(1) \int \frac{\sin^5 x}{\cos x} dx$$

$$(2) \int \frac{dx}{(4+x^2)^{5/2}}$$

$$(3) \int \sin(\sqrt{1+x}) dx$$

$$(4) \int \arctan(x) dx$$

$$(5) \int \cos^4 x dx$$

$$(6) \int_0^{\pi/2} \frac{\cos x}{4 - \sin^2 x} dx$$

$$(7) \int \frac{\ln(1 + \ln x)}{x} dx$$

$$(8) \int x^2 \arctan x dx$$

$$(9) \int_{-1}^2 \frac{dx}{(4+2x+x^2)^{5/2}}$$

$$(10) \int x \sin(x^2) e^{x^2} dx$$

$$(11) \int \frac{dx}{\sqrt{x^2+25}}$$

$$(12) \int \frac{2+x}{\sqrt[3]{x+2}+x} dx$$

$$(13) \int \frac{3x^2}{x^2+x-2} dx$$

$$(14) \int \frac{\cos \sqrt[3]{x}}{\sqrt[3]{x}} dx$$

$$(15) \int \frac{dx}{\sqrt{x^2+2x}}$$

$$(16) \int \frac{x^2+3x-3}{(x+1)(x^2+6x+10)} dx$$

$$(17) \int \frac{dx}{x\sqrt{1-x^2}}$$

$$(18) \int x^3 e^{x^2} dx$$

$$(19) \int x^2 \ln x dx$$

$$(20) \int \frac{x^3}{\sqrt{1-x^2}} dx$$

$$(21) \int \tan^4 \theta d\theta$$

$$(22) \int \frac{x+1}{x^2+4x+13} dx$$

$$(23) \int_0^{\pi/2} \frac{\cos x}{\sin^2 x + 5 \sin x + 6} dx$$

$$(24) \int \frac{e^{x/2}}{1+e^x} dx$$

$$(25) \int \frac{2x^2+5x+10}{x^3+2x^2+10x} dx$$

$$(26) \int (x-2)\sqrt{9-x^2} dx$$

$$(27) \int_1^{\sqrt{e}} \frac{\arcsin(\ln x)}{x} dx$$

$$(28) \int_0^1 x e^{-x} dx$$

(29) $\int (\ln x)^2 dx$

(31) $\int \frac{x^2}{x^6 - 1} dx$

(32) $\int \sin^5 x \cos^2 x dx$

(34) $\int_1^e \sin(\ln x) dx$

(36) $\int \frac{dx}{(4 - x^2)^{3/2}}$

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

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

(42) $\int \frac{dx}{x(1 - x)^2}$

(44) $\int (2x + 3) \ln x dx$

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

(48) $\int \frac{x^2}{x^2 + 4x + 5} dx$

(30) $\int \frac{\sin x}{\sqrt{1 + \cos x}} dx$

(Hint: Try a substitution first.)

(33) $\int \frac{1 + e^x}{1 - e^x} dx$

(35) $\int e^{\sqrt{x}} dx$

(37) $\int_2^3 \frac{e^{1/x}}{x^2} dx$

(39) $\int \frac{x - 1}{x^3 + x} dx$

(41) $\int \sin(\sqrt{x}) dx$

(43) $\int \frac{(x - 5)(\sqrt{x - 1} + 3)}{\sqrt{x - 1} + 2} dx$

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

(47) $\int_0^1 (e^x + 1)^{20} e^x dx$

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