

T.D. de Mathématiques Module F112
Primitives et intégrales

1. Calculer les primitives ou intégrales suivantes :

$$a) I = \int_0^1 x(1+x^2)^5 dx$$

$$b) F(x) = \int \frac{2x}{(3x+2)^2} dx$$

$$c) F(x) = \int \cos x(1+\sin x)^3 dx$$

$$d) F(x) = \int x\sqrt{4+x^2} dx$$

$$e) F(x) = \int \frac{\cos x}{\sqrt{1+3\sin x}} dx$$

$$f) F(x) = \int \arctan x dx$$

$$g) I = \int_0^1 \frac{1}{3+x} dx$$

$$h) I = \int_{-1}^1 \arcsin^2 x dx$$

$$i) I = \int_{1/a}^a \frac{\ln x}{x^2+1} dx$$

$$j) I = \int_0^{\pi/4} \cos^4 x \sin^3 x dx$$

$$k) F(x) = \int (4\cos^3 x + \cos x) dx$$

$$l) F(x) = \int e^{3x} \sin(2x+1) dx$$

2. Calculer les primitives ou intégrales suivantes :

$$a) F(x) = \int \frac{x^4+1}{x^3+1} dx$$

$$b) F(x) = \int \frac{2x^2+7}{x^2+6x+9} dx$$

$$c) F(x) = \int \frac{x^2}{(x-1)^2(x^2+1)} dx$$

$$d) F(x) = \int \frac{dx}{(x^2-1)(x^2+x+1)}$$

$$e) F(x) = \int \frac{dx}{\cos^2 x \sin x}$$

$$f) F(x) = \int \frac{\sin^4 x}{\cos^2 x} dx$$

$$g) I = \int_0^{\pi/4} \frac{\tan x}{1+\sin(2x)} dx$$

$$h) F(x) = \int \frac{\cos x + 2\sin x}{\sin x - \cos x} dx$$

$$i) I = \int_0^{\pi/3} \frac{\cos x}{\cos x + \sin(2x)} dx$$

$$j) F(x) = \int \frac{1}{1+\operatorname{ch} x} dx$$

$$k) F(x) = \int \frac{\operatorname{ch}^3 x}{1+\operatorname{sh} x} dx$$

$$l) F(x) = \int \frac{1}{\operatorname{ch}(3x) - \operatorname{ch} x} dx$$