

Analisi Matematica 1 Esercitazione 13-01

January 11, 2021

Esercizio 1: Calcolare i seguenti integrali:

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

2.
$$\int \sqrt{4x^2 - 3} dx \quad (2)$$

3.
$$\int dx \frac{x}{(-2x^2 + x + 1)^{3/2}} \quad (3)$$

4.
$$\int \frac{dx}{(2x + 1)\sqrt{2x^2 + x - 1}} \quad (4)$$

5.
$$\int dx \frac{1}{\sqrt{x} + \sqrt[3]{x}} \quad (5)$$

6.
$$\int x \sqrt{\frac{1-x}{1+x}} dx \quad (6)$$

7.
$$\int dx \frac{1}{(x^2 + 2)^2} \quad (7)$$

8.
$$\int dx x \log(x^3 + x - 2) \quad (8)$$

Esercizio 2: Calcolare i seguenti integrali impropri:

1.
$$\int_1^\infty \frac{x}{\sqrt{(x^2 + 5)^3}} dx \quad (9)$$

2.
$$\int_1^\infty \frac{\arctan x}{x^2 + 1} dx \quad (10)$$

3.
$$\int_0^{\infty} \left(x^3(8+x^4)^{-5/3} + 2xe^{-x} \right) dx \quad (11)$$

4.
$$\int_{1/2}^{+\infty} \frac{dx}{\sqrt{2x}(2x+1)} \quad (12)$$

5.
$$\int_0^{\infty} \frac{9x+8}{(x+2)(x^2+1)} dx \quad (13)$$

Esercizio 3: Determinare per quali valori di a, b il seguente integrale é convergente:

$$\int_0^{+\infty} \frac{1}{x^a(4+9x)^{b+1}} dx \quad (14)$$

dopodiché calcolare:

$$\int_0^{\infty} \frac{dx}{\sqrt{x}(4+9x)} \quad (15)$$