

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^5 + 2x^3 - 4x^2 + 5) = 15x^4 + 6x^2 - 8x$$

$$(1.2) \quad D\left(\frac{\cos x}{x + \operatorname{sen} x}\right) = -\frac{\operatorname{sen}^2 x + x \operatorname{sen} x + \cos^2 x + \cos x}{(x + \operatorname{sen} x)^2} = -\frac{x \operatorname{sen} x + \cos x + 1}{(x + \operatorname{sen} x)^2}$$

$$(1.3) \quad D(\log(3x^2 + 5x - 2)) = \frac{6x + 5}{3x^2 + 5x - 2}$$

$$(1.4) \quad D\left(e^{\frac{2x+3}{4x+5}}\right) = -\frac{2e^{\frac{2x+3}{4x+5}}}{(4x+5)^2}$$

$$(1.5) \quad D(\sqrt{\cos x + 2}) = \frac{-\operatorname{sen} x}{2\sqrt{\cos x + 2}}$$

### 2. Determinare

$$(2.1) \quad \int x^4 dx = \frac{x^5}{5} + c$$

$$(2.2) \quad \int \sqrt{5x} dx = \frac{2}{3}\sqrt{5}x^{3/2} + c$$

$$(2.3) \quad \int \frac{e^{\operatorname{tg} x}}{\cos^2 x} dx = e^{\operatorname{tg} x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

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MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^8 + 2x^5 - 4x^3 - 3) = 16x^7 + 10x^4 - 12x^2$$

$$(1.2) \quad D\left(\frac{\cos x}{x + e^x}\right) = -\frac{e^x \operatorname{sen} x + x \operatorname{sen} x + e^x \cos x + \cos x}{(x + e^x)^2} = -\frac{(x + e^x) \operatorname{sen} x + (e^x + 1) \cos x}{(x + e^x)^2}$$

$$(1.3) \quad D(\log(5x^2 + 4x - 7)) = \frac{10x + 4}{5x^2 + 4x - 7}$$

$$(1.4) \quad D\left(e^{\frac{2x-3}{5x+4}}\right) = \frac{23e^{\frac{2x-3}{5x+4}}}{(5x+4)^2}$$

$$(1.5) \quad D\left(\frac{1}{\log 2 + x^2}\right) = \frac{-2x}{(\log 2 + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{x} dx = \log|x| + c$$

$$(2.2) \quad \int \operatorname{sen}(7x) dx = -\frac{1}{7} \cos(7x) + c$$

$$(2.3) \quad \int e^x \operatorname{sen}(e^x) dx = -\cos(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

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MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^6 - 4x^4 + 6x^2 - 9) = 18x^5 - 16x^3 + 12x = 2x(9x^4 - 8x^2 + 6)$$

$$(1.2) \quad D\left(\frac{\operatorname{sen} x}{x + \log x}\right) = \frac{(x + \log x) \cos x - \left(\frac{1}{x} + 1\right) \operatorname{sen} x}{(x + \log x)^2} = \frac{x^2 \cos x - x \operatorname{sen} x - \operatorname{sen} x + x \log x \cos x}{x(x + \log x)^2}$$

$$(1.3) \quad D(\log(8x^2 - 3x - 9)) = \frac{16x - 3}{8x^2 - 3x - 9}$$

$$(1.4) \quad D\left(e^{\frac{2x+3}{5-4x}}\right) = \frac{22e^{\frac{2x+3}{5-4x}}}{(5-4x)^2}$$

$$(1.5) \quad D\left(\frac{2x-3}{x^2+1}\right) = \frac{-2x^2 + 6x + 2}{(x^2+1)^2}$$

### 2. Determinare

$$(2.1) \quad \int \cos x \, dx = \operatorname{sen} x + c$$

$$(2.2) \quad \int \frac{1}{1+9x^2} \, dx = \frac{1}{3} \operatorname{arctg}(3x) + c$$

$$(2.3) \quad \int \frac{\cos x}{\cos^2(\operatorname{sen} x)} \, dx = \operatorname{tg}(\operatorname{sen} x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

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MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^9 + 3x^6 - 2x^4 - 2) = 18x^8 + 18x^5 - 8x^3 = 2x^3(9x^5 + 9x^2 - 4)$$

$$(1.2) \quad D\left(\frac{\operatorname{sen} x}{x + e^x}\right) = \frac{-e^x \operatorname{sen} x - \operatorname{sen} x + e^x \cos x + x \cos x}{(x + e^x)^2} = \frac{(x + e^x) \cos x - (e^x + 1) \operatorname{sen} x}{(x + e^x)^2}$$

$$(1.3) \quad D(\log(7x^2 + 2x - 5)) = \frac{14x + 2}{7x^2 + 2x - 5}$$

$$(1.4) \quad D\left(e^{\frac{2x+3}{x+3}}\right) = \frac{3e^{\frac{2x+3}{x+3}}}{(x+3)^2}$$

$$(1.5) \quad D\left(\frac{\operatorname{sen} x}{e^{3x} + x^2}\right) = \frac{(e^{3x} + x^2) \cos x - (3e^{3x} + x^2) \operatorname{sen} x}{(e^{3x} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \operatorname{sen} x \, dx = -\cos x + c$$

$$(2.2) \quad \int \frac{1}{\sqrt{1-4x^2}} \, dx = \frac{1}{2} \operatorname{arcsen}(2x) + c$$

$$(2.3) \quad \int \frac{\operatorname{sen} x}{\cos x} \, dx = -\log |\cos x| + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

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### 1. Calcolare

$$(1.1) \quad D(3x^8 - x^7 + 5x^2 - 9) = 24x^7 - 7x^6 + 10x = x(24x^6 - 7x^5 + 10)$$

$$(1.2) \quad D\left(\frac{e^x}{x + \operatorname{sen} x}\right) = \frac{e^x(x + \operatorname{sen} x - \cos x - 1)}{(x + \operatorname{sen} x)^2}$$

$$(1.3) \quad D(\log(6x^2 - 4x + 7)) = \frac{12x - 4}{6x^2 - 4x + 7}$$

$$(1.4) \quad D\left(e^{\frac{2x+3}{x-3}}\right) = -\frac{9e^{\frac{2x+3}{x-3}}}{(x-3)^2}$$

$$(1.5) \quad D((7x^2 + x^5) \log(2 + e^x)) = (14x + 5x^4) \log(2 + e^x) + (7x^2 + x^5) \frac{e^x}{2 + e^x}$$

### 2. Determinare

$$(2.1) \quad \int e^x dx = e^x + c$$

$$(2.2) \quad \int \frac{1}{\cos^2(3x)} dx = \frac{1}{3} \operatorname{tg}(3x) + c$$

$$(2.3) \quad \int \frac{\cos(\log x)}{x} dx = \operatorname{sen}(\log x) + c$$

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### 1. Calcolare

$$(1.1) \quad D(x^9 - 2x^8 - 4x^3 + 12) = 9x^8 - 16x^7 - 12x^2 = x^2(9x^6 - 16x^5 - 12)$$

$$(1.2) \quad D\left(\frac{e^x}{x + \cos x}\right) = \frac{e^x(x + \operatorname{sen} x + \cos x - 1)}{(x + \cos x)^2}$$

$$(1.3) \quad D(\log(7x^2 - 3x - 12)) = \frac{14x - 3}{7x^2 - 3x - 12}$$

$$(1.4) \quad D\left(e^{\frac{3x+2}{4x+5}}\right) = \frac{7e^{\frac{3x+2}{4x+5}}}{(4x+5)^2}$$

$$(1.5) \quad D\left(\operatorname{arctg}(e^{x^2} + x^2)\right) = \frac{2x(e^{x^2} + 1)}{1 + (e^{x^2} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{1+x^2} dx = \operatorname{arctg} x + c$$

$$(2.2) \quad \int \sqrt{3x} dx = \frac{2}{3}\sqrt{3}x^{3/2} + c$$

$$(2.3) \quad \int \operatorname{sen} x (e^{\cos x}) dx = -e^{\cos x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

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### 1. Calcolare

$$(1.1) \quad D(2x^7 - 6x^5 - x^4 - 6) = 14x^6 - 30x^4 - 4x^3 = 2x^3(7x^3 - 15x - 2)$$

$$(1.2) \quad D\left(\frac{e^x}{x + \log x}\right) = \frac{e^x(x^2 - x + x \log x - 1)}{x(x + \log x)^2}$$

$$(1.3) \quad D(\log(6x^2 + 4x - 5)) = \frac{12x + 4}{6x^2 + 4x - 5}$$

$$(1.4) \quad D\left(e^{\frac{3x-2}{5x+4}}\right) = \frac{22e^{\frac{3x-2}{5x+4}}}{(5x+4)^2}$$

$$(1.5) \quad D(-x^2 + 2x^2 \log x) = 4x \log x$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\sqrt{1-x^2}} dx = \arcsen x + c$$

$$(2.2) \quad \int \frac{1}{6x} dx = \frac{\log|x|}{6} + c$$

$$(2.3) \quad \int \frac{e^x}{(e^x)^2 + 1} dx = \arctg(e^x) + c$$

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MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^4 - 5x^3 - 6x^2 - 5) = 8x^3 - 15x^2 - 12x = x(8x^2 - 15x - 12)$$

$$(1.2) \quad D\left(\frac{\log x}{x + \operatorname{sen} x}\right) = \frac{\frac{x + \operatorname{sen} x}{x} - (\log x)(\cos x + 1)}{(x + \operatorname{sen} x)^2} = -\frac{-x + x \log x - \operatorname{sen} x + x \log x \cos x}{x(x + \operatorname{sen} x)^2}$$

$$(1.3) \quad D(\log(x^2 + 15x - 8)) = \frac{2x + 15}{x^2 + 15x - 8}$$

$$(1.4) \quad D\left(e^{\frac{3x+2}{-4x+5}}\right) = \frac{23e^{\frac{3x+2}{5-4x}}}{(5-4x)^2}$$

$$(1.5) \quad D(e^{\operatorname{arctg} x}) = \frac{e^{\operatorname{arctg} x}}{1+x^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\cos^2 x} dx = \operatorname{tg} x + c$$

$$(2.2) \quad \int \cos(9x) dx = \frac{1}{9} \operatorname{sen}(9x) + c$$

$$(2.3) \quad \int \frac{1}{\sqrt{1-x^2} \operatorname{arcsen} x} dx = \log |\operatorname{arcsen} x| + c$$



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### 1. Calcolare

$$(1.1) \quad D(5x^6 - 5x^5 + 4x^3 + 8) = 30x^5 - 25x^4 + 12x^2 = x^2(30x^3 - 25x^2 + 12)$$

$$(1.2) \quad D\left(\frac{\arcsen x}{x + e^x}\right) = \frac{\frac{x+e^x}{\sqrt{1-x^2}} - (e^x + 1) \arcsen x}{(x + e^x)^2} = -\frac{e^x \sqrt{1-x^2} \arcsen x + \sqrt{1-x^2} \arcsen x - x - e^x}{(x + e^x)^2 \sqrt{1-x^2}}$$

$$(1.3) \quad D(\log(2x^2 + 4x - 7)) = \frac{4x + 4}{2x^2 + 4x - 7}$$

$$(1.4) \quad D\left(e^{\frac{3x+2}{3x+1}}\right) = -\frac{3e^{\frac{3x+2}{3x+1}}}{(3x+1)^2}$$

$$(1.5) \quad D(\sqrt{\cos x + 2}) = \frac{-\sen x}{2\sqrt{\cos x + 2}}$$

### 2. Determinare

$$(2.1) \quad \int x^4 dx = \frac{x^5}{5} + c$$

$$(2.2) \quad \int \sen(5x) dx = -\frac{1}{5} \cos(5x) + c$$

$$(2.3) \quad \int \frac{e^{\tg x}}{\cos^2 x} dx = e^{\tg x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

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MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^7 + x^6 + 2x^5 - 1) = 21x^6 + 6x^5 + 10x^4 = x^4(21x^2 + 6x + 10)$$

$$(1.2) \quad D\left(\frac{\log x}{x + \cos x}\right) = \frac{x - x \log x + \cos x + x(\log x)\text{sen}x}{x(x + \cos x)^2}$$

$$(1.3) \quad D(\log(3x^2 + 9x - 7)) = \frac{6x + 9}{3x^2 + 9x - 7}$$

$$(1.4) \quad D\left(e^{\frac{3x+2}{x-3}}\right) = -\frac{11e^{\frac{3x+2}{x-3}}}{(x-3)^2}$$

$$(1.5) \quad D\left(\frac{1}{\log 2 + x^2}\right) = \frac{-2x}{(\log 2 + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{x} dx = \log|x| + c$$

$$(2.2) \quad \int \frac{1}{1 + 4x^2} dx = \frac{1}{2} \text{arctg}(2x) + c$$

$$(2.3) \quad \int e^x \text{sen}(e^x) dx = -\cos(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

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MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^8 - x^4 + 3x^3 - 11) = 16x^7 - 4x^3 + 9x^2 = x^2(16x^5 - 4x + 9)$$

$$(1.2) \quad D\left(\frac{\log x}{x + e^x}\right) = \frac{x + e^x - (e^x + 1)x \log x}{x(x + e^x)^2} = -\frac{-x - e^x + e^x x \log x + x \log x}{x(x + e^x)^2}$$

$$(1.3) \quad D(\log(4x^2 - 7x - 6)) = \frac{8x - 7}{4x^2 - 7x - 6}$$

$$(1.4) \quad D\left(e^{\frac{2x+4}{x+5}}\right) = \frac{6e^{\frac{2(x+2)}{x+5}}}{(x+5)^2}$$

$$(1.5) \quad D\left(\frac{2x-3}{x^2+1}\right) = \frac{-2x^2 + 6x + 2}{(x^2+1)^2}$$

### 2. Determinare

$$(2.1) \quad \int \cos x \, dx = \operatorname{sen} x + c$$

$$(2.2) \quad \int \frac{1}{\sqrt{1-9x^2}} \, dx = \frac{1}{3} \operatorname{arcsen}(3x) + c$$

$$(2.3) \quad \int \frac{\cos x}{\cos^2(\operatorname{sen} x)} \, dx = \operatorname{tg}(\operatorname{sen} x) + c$$

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MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(4x^7 - 3x^6 + 2x^5 - 6x) = 28x^6 - 18x^5 + 10x^4 - 6 = 2(14x^6 - 9x^5 + 5x^4 - 3)$$

$$(1.2) \quad D\left(\frac{\log x}{x + \log x}\right) = \frac{1 - \log x}{(x + \log x)^2}$$

$$(1.3) \quad D(\log(5x^2 + 9x - 3)) = \frac{10x + 9}{5x^2 + 9x - 3}$$

$$(1.4) \quad D\left(e^{\frac{2x-4}{2x+1}}\right) = \frac{10e^{\frac{2(x-2)}{2x+1}}}{(2x+1)^2}$$

$$(1.5) \quad D\left(\frac{\operatorname{sen} x}{e^{3x} + x^2}\right) = \frac{(e^{3x} + x^2) \cos x - (3e^{3x} + x^2) \operatorname{sen} x}{(e^{3x} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \operatorname{sen} x \, dx = -\cos x + c$$

$$(2.2) \quad \int \frac{1}{\cos^2(7x)} \, dx = \frac{1}{7} \operatorname{tg}(7x) + c$$

$$(2.3) \quad \int \frac{\operatorname{sen} x}{\cos x} \, dx = -\log |\cos x| + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

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MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^5 - 2x^4 + 4x^2 - 7x) = 15x^4 - 8x^3 + 8x - 7$$

$$(1.2) \quad D\left(\frac{\arcsen x}{x + \log x}\right) = \frac{\frac{x + \log x}{\sqrt{1-x^2}} - \left(\frac{1}{x} + 1\right) \arcsen x}{(x + \log x)^2} = \frac{x^2 - \sqrt{1-x^2}x \arcsen x - \sqrt{1-x^2} \arcsen x + x \log x}{x\sqrt{1-x^2}(x + \log x)^2}$$

$$(1.3) \quad D(\log(6x^2 - 4x - 1)) = \frac{12x - 4}{6x^2 - 4x - 1}$$

$$(1.4) \quad D\left(e^{\frac{2x+4}{3x+1}}\right) = -\frac{10e^{\frac{2(x+2)}{3x+1}}}{(3x+1)^2}$$

$$(1.5) \quad D((7x^2 + x^5) \log(2 + e^x)) = (14x + 5x^4) \log(2 + e^x) + (7x^2 + x^5) \frac{e^x}{2 + e^x}$$

### 2. Determinare

$$(2.1) \quad \int e^x dx = e^x + c$$

$$(2.2) \quad \int \sqrt{7x} dx = \frac{2}{3} \sqrt{7} x^{3/2} + c$$

$$(2.3) \quad \int \frac{\cos(\log x)}{x} dx = \text{sen}(\log x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

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MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(4x^9 - 6x^8 + 5x^4 - 11x) = 36x^8 - 48x^7 + 20x^3 - 11$$

$$(1.2) \quad D\left(\frac{\operatorname{arctg}x}{x + \operatorname{sen}x}\right) = \frac{\frac{x + \operatorname{sen}x}{x^2 + 1} - (\cos x + 1)\operatorname{arctg}x}{(x + \operatorname{sen}x)^2}$$

$$(1.3) \quad D(\log(7x^2 + 8x - 6)) = \frac{14x + 8}{7x^2 + 8x - 6}$$

$$(1.4) \quad D\left(e^{\frac{2x-4}{x+3}}\right) = \frac{10e^{\frac{2(x-2)}{x+3}}}{(x+3)^2}$$

$$(1.5) \quad D\left(\operatorname{arctg}\left(e^{x^2} + x^2\right)\right) = \frac{2x(e^{x^2} + 1)}{1 + (e^{x^2} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{1+x^2} dx = \operatorname{arctg}x + c$$

$$(2.2) \quad \int \frac{1}{5x} dx = \frac{\log|x|}{5} + c$$

$$(2.3) \quad \int \operatorname{sen}x (e^{\cos x}) dx = -e^{\cos x} + c$$

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MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^7 + 4x^6 + 3x^3 - 11x^2) = 14x^6 + 24x^5 + 9x^2 - 22x = x(14x^5 + 24x^4 + 9x - 22)$$

$$(1.2) \quad D\left(\frac{\operatorname{arctg}x}{x + \cos x}\right) = \frac{(x^2 + 1)(\operatorname{sen}x - 1)\operatorname{arctg}x + x + \cos x}{(x^2 + 1)(x + \cos x)^2}$$

$$(1.3) \quad D(\log(8x^2 + 3x - 7)) = \frac{16x + 3}{8x^2 + 3x - 7}$$

$$(1.4) \quad D\left(e^{\frac{2x+4}{x+3}}\right) = \frac{2e^{\frac{2(x+2)}{x+3}}}{(x+3)^2}$$

$$(1.5) \quad D(-x^2 + 2x^2 \log x) = 4x \log x$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\sqrt{1-x^2}} dx = \operatorname{arcsen}x + c$$

$$(2.2) \quad \int \cos(8x) dx = \frac{1}{8}\operatorname{sen}(8x) + c$$

$$(2.3) \quad \int \frac{e^x}{(e^x)^2 + 1} dx = \operatorname{arctg}(e^x) + c$$

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MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^6 + 3x^5 - x^4 + 2x^3) = 12x^5 + 15x^4 - 4x^3 + 6x^2 = x^2(12x^3 + 15x^2 - 4x + 6)$$

$$(1.2) \quad D\left(\frac{\cos x}{x + \arcsen x}\right) = -\frac{(x + \arcsen x) \operatorname{sen} x + \left(\frac{1}{\sqrt{1-x^2}} + 1\right) \cos x}{(x + \arcsen x)^2}$$

$$(1.3) \quad D(\log(9x^2 + 15x - 5)) = \frac{18x + 15}{9x^2 + 15x - 5}$$

$$(1.4) \quad D\left(e^{\frac{4x+2}{x+2}}\right) = \frac{6e^{\frac{4x+2}{x+2}}}{(x+2)^2}$$

$$(1.5) \quad D(e^{\operatorname{arctg} x}) = \frac{e^{\operatorname{arctg} x}}{1+x^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\cos^2 x} dx = \operatorname{tg} x + c$$

$$(2.2) \quad \int \operatorname{sen}(3x) dx = -\frac{1}{3} \cos(3x) + c$$

$$(2.3) \quad \int \frac{1}{\sqrt{1-x^2} \arcsen x} dx = \log |\arcsen x| + c$$



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### 1. Calcolare

$$(1.1) \quad D(4x^5 + 2x^4 - 7x^3 + 2x) = 20x^4 + 8x^3 - 21x^2 + 2$$

$$(1.2) \quad D\left(\frac{\cos x}{x + \operatorname{arctg}x}\right) = -\frac{\left(\frac{1}{x^2+1} + 1\right) \cos x + \operatorname{sen}x (x + \operatorname{arctg}x)}{(x + \operatorname{arctg}x)^2}$$

$$(1.3) \quad D(\log(x^2 + 4x - 12)) = \frac{2x + 4}{x^2 + 4x - 12}$$

$$(1.4) \quad D\left(e^{\frac{4x-2}{3x+1}}\right) = \frac{10e^{\frac{4x-2}{3x+1}}}{(3x+1)^2}$$

$$(1.5) \quad D(\sqrt{\cos x + 2}) = \frac{-\operatorname{sen}x}{2\sqrt{\cos x + 2}}$$

### 2. Determinare

$$(2.1) \quad \int x^4 dx = \frac{x^5}{5} + c$$

$$(2.2) \quad \int \frac{1}{1 + 16x^2} dx = \frac{1}{4} \operatorname{arctg}(4x) + c$$

$$(2.3) \quad \int \frac{e^{\operatorname{tg}x}}{\cos^2 x} dx = e^{\operatorname{tg}x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

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MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^7 + x^6 - 5x^4 - 9x) = 21x^6 + 6x^5 - 20x^3 - 9$$

$$(1.2) \quad D\left(\frac{\operatorname{arctg}x}{x + \operatorname{arctg}x}\right) = -\frac{x^2 \operatorname{arctg}x - x + \operatorname{arctg}x}{(x^2 + 1)(x + \operatorname{arctg}x)^2}$$

$$(1.3) \quad D(\log(2x^2 - 7x + 9)) = \frac{4x - 7}{2x^2 - 7x + 9}$$

$$(1.4) \quad D\left(e^{\frac{4x+2}{2x-1}}\right) = -\frac{8e^{\frac{4x+2}{2x-1}}}{(1-2x)^2}$$

$$(1.5) \quad D\left(\frac{1}{\log 2 + x^2}\right) = \frac{-2x}{(\log 2 + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{x} dx = \log|x| + c$$

$$(2.2) \quad \int \frac{1}{\sqrt{1-25x^2}} dx = \frac{1}{5} \operatorname{arcsen}(5x) + c$$

$$(2.3) \quad \int e^x \operatorname{sen}(e^x) dx = -\cos(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(4x^6 + 2x^5 + 2x^3 - 6x) = 24x^5 + 10x^4 + 6x^2 - 6 = 2(12x^5 + 5x^4 + 3x^2 - 3)$$

$$(1.2) \quad D\left(\frac{\operatorname{arctg}x}{x + e^x}\right) = \frac{\frac{x+e^x}{x^2+1} - (e^x + 1)\operatorname{arctg}x}{(x + e^x)^2} = -\frac{e^x x^2 \operatorname{arctg}x + x^2 \operatorname{arctg}x - x - e^x + e^x \operatorname{arctg}x + \operatorname{arctg}x}{(x + e^x)^2 (x^2 + 1)}$$

$$(1.3) \quad D(\log(3x^2 - 8x - 9)) = \frac{6x - 8}{3x^2 - 8x - 9}$$

$$(1.4) \quad D\left(e^{\frac{4x+2}{3x+1}}\right) = -\frac{2e^{\frac{4x+2}{3x+1}}}{(3x+1)^2}$$

$$(1.5) \quad D\left(\frac{2x-3}{x^2+1}\right) = \frac{-2x^2 + 6x + 2}{(x^2+1)^2}$$

### 2. Determinare

$$(2.1) \quad \int \cos x \, dx = \operatorname{sen}x + c$$

$$(2.2) \quad \int \frac{1}{\cos^2(4x)} \, dx = \frac{1}{4} \operatorname{tg}(4x) + c$$

$$(2.3) \quad \int \frac{\cos x}{\cos^2(\operatorname{sen}x)} \, dx = \operatorname{tg}(\operatorname{sen}x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^8 - 4x^7 + 3x^4 - 5) = 16x^7 - 28x^6 + 12x^3 = 4x^3(4x^4 - 7x^3 + 3)$$

$$(1.2) \quad D\left(\frac{\cos x}{x + \operatorname{sen} x}\right) = -\frac{\operatorname{sen}^2 x + x \operatorname{sen} x + \cos^2 x + \cos x}{(x + \operatorname{sen} x)^2} = -\frac{x \operatorname{sen} x + \cos x + 1}{(x + \operatorname{sen} x)^2}$$

$$(1.3) \quad D(\log(4x^2 + 2x - 7)) = \frac{8x + 2}{4x^2 + 2x - 7}$$

$$(1.4) \quad D\left(e^{\frac{4x+2}{3x-1}}\right) = -\frac{10e^{\frac{4x+2}{3x-1}}}{(1-3x)^2}$$

$$(1.5) \quad D\left(\frac{\operatorname{sen} x}{e^{3x} + x^2}\right) = \frac{(e^{3x} + x^2) \cos x - (3e^{3x} + x^2) \operatorname{sen} x}{(e^{3x} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \operatorname{sen} x \, dx = -\cos x + c$$

$$(2.2) \quad \int \frac{1}{8x} \, dx = \frac{\log|x|}{8} + c$$

$$(2.3) \quad \int \frac{\operatorname{sen} x}{\cos x} \, dx = -\log|\cos x| + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^9 - 5x^8 + 4x^2 - 11) = 27x^8 - 40x^7 + 8x = x(27x^7 - 40x^6 + 8)$$

$$(1.2) \quad D\left(\frac{\cos x}{x + e^x}\right) = -\frac{e^x \operatorname{sen} x + x \operatorname{sen} x + e^x \cos x + \cos x}{(x + e^x)^2} = -\frac{(x + e^x) \operatorname{sen} x + (e^x + 1) \cos x}{(x + e^x)^2}$$

$$(1.3) \quad D(\log(5x^2 - 8x - 8)) = \frac{10x - 8}{5x^2 - 8x - 8}$$

$$(1.4) \quad D\left(e^{\frac{3x+4}{x+1}}\right) = -\frac{e^{\frac{3x+4}{x+1}}}{(x+1)^2}$$

$$(1.5) \quad D((7x^2 + x^5) \log(2 + e^x)) = (14x + 5x^4) \log(2 + e^x) + (7x^2 + x^5) \frac{e^x}{2 + e^x}$$

### 2. Determinare

$$(2.1) \quad \int e^x dx = e^x + c$$

$$(2.2) \quad \int \cos(6x) dx = \frac{1}{6} \operatorname{sen}(6x) + c$$

$$(2.3) \quad \int \frac{\cos(\log x)}{x} dx = \operatorname{sen}(\log x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^7 + 2x^6 + 5x + 8) = 21x^6 + 12x^5 + 5$$

$$(1.2) \quad D\left(\frac{\operatorname{sen} x}{x + \log x}\right) = \frac{(x + \log x) \cos x - \left(\frac{1}{x} + 1\right) \operatorname{sen} x}{(x + \log x)^2} = \frac{x^2 \cos x - x \operatorname{sen} x - \operatorname{sen} x + x \log x \cos x}{x(x + \log x)^2}$$

$$(1.3) \quad D(\log(6x^2 - 6x - 7)) = \frac{12x - 6}{6x^2 - 6x - 7}$$

$$(1.4) \quad D\left(e^{\frac{4x+3}{x-1}}\right) = -\frac{7e^{\frac{4x+3}{x-1}}}{(x-1)^2}$$

$$(1.5) \quad D\left(\operatorname{arctg}\left(e^{x^2} + x^2\right)\right) = \frac{2x(e^{x^2} + 1)}{1 + (e^{x^2} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{1+x^2} dx = \operatorname{arctg} x + c$$

$$(2.2) \quad \int \sqrt{5x} dx = \frac{2}{3} \sqrt{5} x^{3/2} + c$$

$$(2.3) \quad \int \operatorname{sen} x (e^{\cos x}) dx = -e^{\cos x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(4x^4 + 7x^3 + x - 6) = 16x^3 + 21x^2 + 1$$

$$(1.2) \quad D\left(\frac{\operatorname{sen} x}{x + e^x}\right) = \frac{-e^x \operatorname{sen} x - \operatorname{sen} x + e^x \cos x + x \cos x}{(x + e^x)^2} = \frac{(x + e^x) \cos x - (e^x + 1) \operatorname{sen} x}{(x + e^x)^2}$$

$$(1.3) \quad D(\log(7x^2 + 5x - 2)) = \frac{14x + 5}{7x^2 + 5x - 2}$$

$$(1.4) \quad D\left(e^{\frac{3x+4}{x+2}}\right) = \frac{2e^{\frac{3x+4}{x+2}}}{(x+2)^2}$$

$$(1.5) \quad D(-x^2 + 2x^2 \log x) = 4x \log x$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\sqrt{1-x^2}} dx = \operatorname{arcsen} x + c$$

$$(2.2) \quad \int \operatorname{sen}(7x) dx = -\frac{1}{7} \cos(7x) + c$$

$$(2.3) \quad \int \frac{e^x}{(e^x)^2 + 1} dx = \operatorname{arctg}(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^5 + 5x^4 + 8x^3 - 6x) = 15x^4 + 20x^3 + 24x^2 - 6$$

$$(1.2) \quad D\left(\frac{e^x}{x + \operatorname{sen}x}\right) = \frac{e^x(x + \operatorname{sen}x - \cos x - 1)}{(x + \operatorname{sen}x)^2}$$

$$(1.3) \quad D(\log(8x^2 + 4x - 1)) = \frac{16x + 4}{8x^2 + 4x - 1}$$

$$(1.4) \quad D\left(e^{\frac{3x+4}{2x+1}}\right) = -\frac{5e^{\frac{3x+4}{2x+1}}}{(2x+1)^2}$$

$$(1.5) \quad D(e^{\operatorname{arctg}x}) = \frac{e^{\operatorname{arctg}x}}{1+x^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\cos^2 x} dx = \operatorname{tg}x + c$$

$$(2.2) \quad \int \frac{1}{1+9x^2} dx = \frac{1}{3} \operatorname{arctg}(3x) + c$$

$$(2.3) \quad \int \frac{1}{\sqrt{1-x^2} \operatorname{arcsen}x} dx = \log|\operatorname{arcsen}x| + c$$



## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^6 - 3x^5 + 7x^2 - 16x) = 12x^5 - 15x^4 + 14x - 16$$

$$(1.2) \quad D\left(\frac{e^x}{x + \cos x}\right) = \frac{e^x(x + \operatorname{sen} x + \cos x - 1)}{(x + \cos x)^2}$$

$$(1.3) \quad D(\log(9x^2 + 9x - 11)) = \frac{18x + 9}{9x^2 + 9x - 11}$$

$$(1.4) \quad D\left(e^{\frac{3x-4}{x+1}}\right) = \frac{7e^{\frac{3x-4}{x+1}}}{(x+1)^2}$$

$$(1.5) \quad D(\sqrt{\cos x + 2}) = \frac{-\operatorname{sen} x}{2\sqrt{\cos x + 2}}$$

### 2. Determinare

$$(2.1) \quad \int x^4 dx = \frac{x^5}{5} + c$$

$$(2.2) \quad \int \frac{1}{\sqrt{1-4x^2}} dx = \frac{1}{2} \operatorname{arcsen}(2x) + c$$

$$(2.3) \quad \int \frac{e^{\operatorname{tg} x}}{\cos^2 x} dx = e^{\operatorname{tg} x} + c$$

ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

1. Calcolare

$$(1.1) \quad D(3x^6 - 2x^4 + 9x^2 + 11x) = 18x^5 - 8x^3 + 18x + 11$$

$$(1.2) \quad D\left(\frac{e^x}{x + \log x}\right) = \frac{e^x(x^2 - x + x \log x - 1)}{x(x + \log x)^2}$$

$$(1.3) \quad D(\log(2x^2 + 15x - 7)) = \frac{4x + 15}{2x^2 + 15x - 7}$$

$$(1.4) \quad D\left(e^{\frac{4x-3}{x-1}}\right) = -\frac{e^{\frac{4x-3}{x-1}}}{(x-1)^2}$$

$$(1.5) \quad D\left(\frac{1}{\log 2 + x^2}\right) = \frac{-2x}{(\log 2 + x^2)^2}$$

2. Determinare

$$(2.1) \quad \int \frac{1}{x} dx = \log|x| + c$$

$$(2.2) \quad \int \frac{1}{\cos^2(3x)} dx = \frac{1}{3} \operatorname{tg}(3x) + c$$

$$(2.3) \quad \int e^x \operatorname{sen}(e^x) dx = -\cos(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^9 + 5x^7 - 7x^3 - 16) = 18x^8 + 35x^6 - 21x^2 = x^2(18x^6 + 35x^4 - 21)$$

$$(1.2) \quad D\left(\frac{\log x}{x + \operatorname{sen} x}\right) = \frac{\frac{x + \operatorname{sen} x}{x} - (\log x)(\cos x + 1)}{(x + \operatorname{sen} x)^2} = -\frac{-x + x \log x - \operatorname{sen} x + x \log x \cos x}{x(x + \operatorname{sen} x)^2}$$

$$(1.3) \quad D(\log(3x^2 + 8x - 8)) = \frac{6x + 8}{3x^2 + 8x - 8}$$

$$(1.4) \quad D\left(e^{\frac{3x-4}{x+2}}\right) = \frac{10e^{\frac{3x-4}{x+2}}}{(x+2)^2}$$

$$(1.5) \quad D\left(\frac{2x-3}{x^2+1}\right) = \frac{-2x^2 + 6x + 2}{(x^2+1)^2}$$

### 2. Determinare

$$(2.1) \quad \int \cos x \, dx = \operatorname{sen} x + c$$

$$(2.2) \quad \int \sqrt{3x} \, dx = \frac{2}{3} \sqrt{3} x^{3/2} + c$$

$$(2.3) \quad \int \frac{\cos x}{\cos^2(\operatorname{sen} x)} \, dx = \operatorname{tg}(\operatorname{sen} x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^7 + 2x^5 + 6x^4 + 4x^2) = 21x^6 + 10x^4 + 24x^3 + 8x = x(21x^5 + 10x^3 + 24x^2 + 8)$$

$$(1.2) \quad D\left(\frac{\arcsen x}{x + e^x}\right) = \frac{\frac{x+e^x}{\sqrt{1-x^2}} - (e^x + 1) \arcsen x}{(x + e^x)^2} = -\frac{e^x \sqrt{1-x^2} \arcsen x + \sqrt{1-x^2} \arcsen x - x - e^x}{(x + e^x)^2 \sqrt{1-x^2}}$$

$$(1.3) \quad D(\log(4x^2 + 9x - 8)) = \frac{8x + 9}{4x^2 + 9x - 8}$$

$$(1.4) \quad D\left(e^{\frac{3x-4}{2x-1}}\right) = \frac{5e^{\frac{4-3x}{1-2x}}}{(1-2x)^2}$$

$$(1.5) \quad D\left(\frac{\sen x}{e^{3x} + x^2}\right) = \frac{(e^{3x} + x^2) \cos x - (3e^{3x} + x^2) \sen x}{(e^{3x} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \sen x \, dx = -\cos x + c$$

$$(2.2) \quad \int \frac{1}{6x} \, dx = \frac{\log|x|}{6} + c$$

$$(2.3) \quad \int \frac{\sen x}{\cos x} \, dx = -\log|\cos x| + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(6x^6 - 3x^4 - 8x^2 + 2x) = 36x^5 - 12x^3 - 16x + 2 = 2(18x^5 - 6x^3 - 8x + 1)$$

$$(1.2) \quad D\left(\frac{\log x}{x + \cos x}\right) = \frac{x - x \log x + \cos x + x(\log x)\operatorname{sen}x}{x(x + \cos x)^2}$$

$$(1.3) \quad D(\log(5x^2 + x - 1)) = \frac{10x + 1}{5x^2 + x - 1}$$

$$(1.4) \quad D\left(e^{\frac{3x-4}{x+4}}\right) = \frac{16e^{\frac{3x-4}{x+4}}}{(x+4)^2}$$

$$(1.5) \quad D((7x^2 + x^5)\log(2 + e^x)) = (14x + 5x^4)\log(2 + e^x) + (7x^2 + x^5)\frac{e^x}{2 + e^x}$$

### 2. Determinare

$$(2.1) \quad \int e^x dx = e^x + c$$

$$(2.2) \quad \int \cos(9x) dx = \frac{1}{9}\operatorname{sen}(9x) + c$$

$$(2.3) \quad \int \frac{\cos(\log x)}{x} dx = \operatorname{sen}(\log x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^5 + 2x^3 - 4x^2 + 5) = 15x^4 + 6x^2 - 8x$$

$$(1.2) \quad D\left(\frac{\log x}{x + e^x}\right) = \frac{x + e^x - (e^x + 1)x \log x}{x(x + e^x)^2} = -\frac{-x - e^x + e^x x \log x + x \log x}{x(x + e^x)^2}$$

$$(1.3) \quad D(\log(6x^2 + 5x - 3)) = \frac{12x + 5}{6x^2 + 5x - 3}$$

$$(1.4) \quad D\left(e^{\frac{4x-3}{2x+1}}\right) = \frac{10e^{\frac{4x-3}{2x+1}}}{(2x+1)^2}$$

$$(1.5) \quad D\left(\operatorname{arctg}(e^{x^2} + x^2)\right) = \frac{2x(e^{x^2} + 1)}{1 + (e^{x^2} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{1+x^2} dx = \operatorname{arctg} x + c$$

$$(2.2) \quad \int \operatorname{sen}(5x) dx = -\frac{1}{5} \cos(5x) + c$$

$$(2.3) \quad \int \operatorname{sen} x (e^{\cos x}) dx = -e^{\cos x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^8 + 2x^5 - 4x^3 - 3) = 16x^7 + 10x^4 - 12x^2$$

$$(1.2) \quad D\left(\frac{\log x}{x + \log x}\right) = \frac{1 - \log x}{(x + \log x)^2}$$

$$(1.3) \quad D(\log(7x^2 + 7x - 6)) = \frac{14x + 7}{7x^2 + 7x - 6}$$

$$(1.4) \quad D\left(e^{\frac{2x+3}{4x+5}}\right) = -\frac{2e^{\frac{2x+3}{4x+5}}}{(4x+5)^2}$$

$$(1.5) \quad D(-x^2 + 2x^2 \log x) = 4x \log x$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\sqrt{1-x^2}} dx = \arcsen x + c$$

$$(2.2) \quad \int \frac{1}{1+4x^2} dx = \frac{1}{2} \arctg(2x) + c$$

$$(2.3) \quad \int \frac{e^x}{(e^x)^2 + 1} dx = \arctg(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^6 - 4x^4 + 6x^2 - 9) = 18x^5 - 16x^3 + 12x = 2x(9x^4 - 8x^2 + 6)$$

$$(1.2) \quad D\left(\frac{\arcsen x}{x + \log x}\right) = \frac{\frac{x + \log x}{\sqrt{1-x^2}} - \left(\frac{1}{x} + 1\right) \arcsen x}{(x + \log x)^2} = \frac{x^2 - \sqrt{1-x^2}x \arcsen x - \sqrt{1-x^2} \arcsen x + x \log x}{x\sqrt{1-x^2}(x + \log x)^2}$$

$$(1.3) \quad D(\log(3x^2 + 5x - 2)) = \frac{6x + 5}{3x^2 + 5x - 2}$$

$$(1.4) \quad D\left(e^{\frac{2x-3}{5x+4}}\right) = \frac{23e^{\frac{2x-3}{5x+4}}}{(5x+4)^2}$$

$$(1.5) \quad D(e^{\arctg x}) = \frac{e^{\arctg x}}{1+x^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\cos^2 x} dx = \operatorname{tg} x + c$$

$$(2.2) \quad \int \frac{1}{\sqrt{1-9x^2}} dx = \frac{1}{3} \arcsen(3x) + c$$

$$(2.3) \quad \int \frac{1}{\sqrt{1-x^2} \arcsen x} dx = \log |\arcsen x| + c$$



## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^9 + 3x^6 - 2x^4 - 2) = 18x^8 + 18x^5 - 8x^3 = 2x^3(9x^5 + 9x^2 - 4)$$

$$(1.2) \quad D\left(\frac{\operatorname{arctg}x}{x + \operatorname{sen}x}\right) = \frac{\frac{x + \operatorname{sen}x}{x^2 + 1} - (\cos x + 1)\operatorname{arctg}x}{(x + \operatorname{sen}x)^2}$$

$$(1.3) \quad D(\log(5x^2 + 4x - 7)) = \frac{10x + 4}{5x^2 + 4x - 7}$$

$$(1.4) \quad D\left(e^{\frac{2x+3}{5-4x}}\right) = \frac{22e^{\frac{2x+3}{5-4x}}}{(5-4x)^2}$$

$$(1.5) \quad D(\sqrt{\cos x + 2}) = \frac{-\operatorname{sen}x}{2\sqrt{\cos x + 2}}$$

### 2. Determinare

$$(2.1) \quad \int x^4 dx = \frac{x^5}{5} + c$$

$$(2.2) \quad \int \frac{1}{\cos^2(7x)} dx = \frac{1}{7}\operatorname{tg}(7x) + c$$

$$(2.3) \quad \int \frac{e^{\operatorname{tg}x}}{\cos^2 x} dx = e^{\operatorname{tg}x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^8 - x^7 + 5x^2 - 9) = 24x^7 - 7x^6 + 10x = x(24x^6 - 7x^5 + 10)$$

$$(1.2) \quad D\left(\frac{\operatorname{arctg} x}{x + \cos x}\right) = \frac{(x^2 + 1)(\operatorname{sen} x - 1)\operatorname{arctg} x + x + \cos x}{(x^2 + 1)(x + \cos x)^2}$$

$$(1.3) \quad D(\log(8x^2 - 3x - 9)) = \frac{16x - 3}{8x^2 - 3x - 9}$$

$$(1.4) \quad D\left(e^{\frac{2x+3}{x+3}}\right) = \frac{3e^{\frac{2x+3}{x+3}}}{(x+3)^2}$$

$$(1.5) \quad D\left(\frac{1}{\log 2 + x^2}\right) = \frac{-2x}{(\log 2 + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{x} dx = \log|x| + c$$

$$(2.2) \quad \int \sqrt{7x} dx = \frac{2}{3}\sqrt{7}x^{3/2} + c$$

$$(2.3) \quad \int e^x \operatorname{sen}(e^x) dx = -\cos(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(x^9 - 2x^8 - 4x^3 + 12) = 9x^8 - 16x^7 - 12x^2 = x^2(9x^6 - 16x^5 - 12)$$

$$(1.2) \quad D\left(\frac{\cos x}{x + \arcsen x}\right) = -\frac{(x + \arcsen x) \operatorname{sen} x + \left(\frac{1}{\sqrt{1-x^2}} + 1\right) \cos x}{(x + \arcsen x)^2}$$

$$(1.3) \quad D(\log(7x^2 + 2x - 5)) = \frac{14x + 2}{7x^2 + 2x - 5}$$

$$(1.4) \quad D\left(e^{\frac{2x+3}{x-3}}\right) = -\frac{9e^{\frac{2x+3}{x-3}}}{(x-3)^2}$$

$$(1.5) \quad D\left(\frac{2x-3}{x^2+1}\right) = \frac{-2x^2 + 6x + 2}{(x^2+1)^2}$$

### 2. Determinare

$$(2.1) \quad \int \cos x \, dx = \operatorname{sen} x + c$$

$$(2.2) \quad \int \frac{1}{5x} \, dx = \frac{\log|x|}{5} + c$$

$$(2.3) \quad \int \frac{\cos x}{\cos^2(\operatorname{sen} x)} \, dx = \operatorname{tg}(\operatorname{sen} x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^7 - 6x^5 - x^4 - 6) = 14x^6 - 30x^4 - 4x^3 = 2x^3(7x^3 - 15x - 2)$$

$$(1.2) \quad D\left(\frac{\cos x}{x + \operatorname{arctg}x}\right) = -\frac{\left(\frac{1}{x^2+1} + 1\right)\cos x + \operatorname{sen}x(x + \operatorname{arctg}x)}{(x + \operatorname{arctg}x)^2}$$

$$(1.3) \quad D(\log(6x^2 - 4x + 7)) = \frac{12x - 4}{6x^2 - 4x + 7}$$

$$(1.4) \quad D\left(e^{\frac{3x+2}{4x+5}}\right) = \frac{7e^{\frac{3x+2}{4x+5}}}{(4x+5)^2}$$

$$(1.5) \quad D\left(\frac{\operatorname{sen}x}{e^{3x} + x^2}\right) = \frac{(e^{3x} + x^2)\cos x - (3e^{3x} + x^2)\operatorname{sen}x}{(e^{3x} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \operatorname{sen}x \, dx = -\cos x + c$$

$$(2.2) \quad \int \cos(8x) \, dx = \frac{1}{8}\operatorname{sen}(8x) + c$$

$$(2.3) \quad \int \frac{\operatorname{sen}x}{\cos x} \, dx = -\log|\cos x| + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^4 - 5x^3 - 6x^2 - 5) = 8x^3 - 15x^2 - 12x = x(8x^2 - 15x - 12)$$

$$(1.2) \quad D\left(\frac{\arctg x}{x + \arctg x}\right) = -\frac{x^2 \arctg x - x + \arctg x}{(x^2 + 1)(x + \arctg x)^2}$$

$$(1.3) \quad D(\log(7x^2 - 3x - 12)) = \frac{14x - 3}{7x^2 - 3x - 12}$$

$$(1.4) \quad D\left(e^{\frac{3x-2}{5x+4}}\right) = \frac{22e^{\frac{3x-2}{5x+4}}}{(5x+4)^2}$$

$$(1.5) \quad D((7x^2 + x^5) \log(2 + e^x)) = (14x + 5x^4) \log(2 + e^x) + (7x^2 + x^5) \frac{e^x}{2 + e^x}$$

### 2. Determinare

$$(2.1) \quad \int e^x dx = e^x + c$$

$$(2.2) \quad \int \sin(3x) dx = -\frac{1}{3} \cos(3x) + c$$

$$(2.3) \quad \int \frac{\cos(\log x)}{x} dx = \sin(\log x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(5x^6 - 5x^5 + 4x^3 + 8) = 30x^5 - 25x^4 + 12x^2 = x^2(30x^3 - 25x^2 + 12)$$

$$(1.2) \quad D\left(\frac{\operatorname{arctg}x}{x+e^x}\right) = \frac{\frac{x+e^x}{x^2+1} - (e^x+1)\operatorname{arctg}x}{(x+e^x)^2} = -\frac{e^x x^2 \operatorname{arctg}x + x^2 \operatorname{arctg}x - x - e^x + e^x \operatorname{arctg}x + \operatorname{arctg}x}{(x+e^x)^2(x^2+1)}$$

$$(1.3) \quad D(\log(6x^2 + 4x - 5)) = \frac{12x + 4}{6x^2 + 4x - 5}$$

$$(1.4) \quad D\left(e^{\frac{3x+2}{-4x+5}}\right) = \frac{23e^{\frac{3x+2}{5-4x}}}{(5-4x)^2}$$

$$(1.5) \quad D\left(\operatorname{arctg}\left(e^{x^2} + x^2\right)\right) = \frac{2x(e^{x^2} + 1)}{1 + (e^{x^2} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{1+x^2} dx = \operatorname{arctg}x + c$$

$$(2.2) \quad \int \frac{1}{1+16x^2} dx = \frac{1}{4} \operatorname{arctg}(4x) + c$$

$$(2.3) \quad \int \operatorname{sen}x (e^{\cos x}) dx = -e^{\cos x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^7 + x^6 + 2x^5 - 1) = 21x^6 + 6x^5 + 10x^4 = x^4(21x^2 + 6x + 10)$$

$$(1.2) \quad D\left(\frac{\cos x}{x + \operatorname{sen} x}\right) = -\frac{\operatorname{sen}^2 x + x \operatorname{sen} x + \cos^2 x + \cos x}{(x + \operatorname{sen} x)^2} = -\frac{x \operatorname{sen} x + \cos x + 1}{(x + \operatorname{sen} x)^2}$$

$$(1.3) \quad D(\log(x^2 + 15x - 8)) = \frac{2x + 15}{x^2 + 15x - 8}$$

$$(1.4) \quad D\left(e^{\frac{3x+2}{3x+1}}\right) = -\frac{3e^{\frac{3x+2}{3x+1}}}{(3x+1)^2}$$

$$(1.5) \quad D(-x^2 + 2x^2 \log x) = 4x \log x$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\sqrt{1-x^2}} dx = \operatorname{arcsen} x + c$$

$$(2.2) \quad \int \frac{1}{\sqrt{1-25x^2}} dx = \frac{1}{5} \operatorname{arcsen}(5x) + c$$

$$(2.3) \quad \int \frac{e^x}{(e^x)^2 + 1} dx = \operatorname{arctg}(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^8 - x^4 + 3x^3 - 11) = 16x^7 - 4x^3 + 9x^2 = x^2(16x^5 - 4x + 9)$$

$$(1.2) \quad D\left(\frac{\cos x}{x + e^x}\right) = -\frac{e^x \operatorname{sen} x + x \operatorname{sen} x + e^x \cos x + \cos x}{(x + e^x)^2} = -\frac{(x + e^x) \operatorname{sen} x + (e^x + 1) \cos x}{(x + e^x)^2}$$

$$(1.3) \quad D(\log(2x^2 + 4x - 7)) = \frac{4x + 4}{2x^2 + 4x - 7}$$

$$(1.4) \quad D\left(e^{\frac{3x+2}{x-3}}\right) = -\frac{11e^{\frac{3x+2}{x-3}}}{(x-3)^2}$$

$$(1.5) \quad D(e^{\operatorname{arctg} x}) = \frac{e^{\operatorname{arctg} x}}{1 + x^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\cos^2 x} dx = \operatorname{tg} x + c$$

$$(2.2) \quad \int \frac{1}{\cos^2(4x)} dx = \frac{1}{4} \operatorname{tg}(4x) + c$$

$$(2.3) \quad \int \frac{1}{\sqrt{1-x^2} \operatorname{arcsen} x} dx = \log |\operatorname{arcsen} x| + c$$



## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(4x^7 - 3x^6 + 2x^5 - 6x) = 28x^6 - 18x^5 + 10x^4 - 6 = 2(14x^6 - 9x^5 + 5x^4 - 3)$$

$$(1.2) \quad D\left(\frac{\operatorname{sen} x}{x + \log x}\right) = \frac{(x + \log x) \cos x - \left(\frac{1}{x} + 1\right) \operatorname{sen} x}{(x + \log x)^2} = \frac{x^2 \cos x - x \operatorname{sen} x - \operatorname{sen} x + x \log x \cos x}{x(x + \log x)^2}$$

$$(1.3) \quad D(\log(3x^2 + 9x - 7)) = \frac{6x + 9}{3x^2 + 9x - 7}$$

$$(1.4) \quad D\left(e^{\frac{2x+4}{x+5}}\right) = \frac{6e^{\frac{2(x+2)}{x+5}}}{(x+5)^2}$$

$$(1.5) \quad D(\sqrt{\cos x + 2}) = \frac{-\operatorname{sen} x}{2\sqrt{\cos x + 2}}$$

### 2. Determinare

$$(2.1) \quad \int x^4 dx = \frac{x^5}{5} + c$$

$$(2.2) \quad \int \frac{1}{8x} dx = \frac{\log|x|}{8} + c$$

$$(2.3) \quad \int \frac{e^{\operatorname{tg} x}}{\cos^2 x} dx = e^{\operatorname{tg} x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^5 - 2x^4 + 4x^2 - 7x) = 15x^4 - 8x^3 + 8x - 7$$

$$(1.2) \quad D\left(\frac{\operatorname{sen} x}{x + e^x}\right) = \frac{-e^x \operatorname{sen} x - \operatorname{sen} x + e^x \cos x + x \cos x}{(x + e^x)^2} = \frac{(x + e^x) \cos x - (e^x + 1) \operatorname{sen} x}{(x + e^x)^2}$$

$$(1.3) \quad D(\log(4x^2 - 7x - 6)) = \frac{8x - 7}{4x^2 - 7x - 6}$$

$$(1.4) \quad D\left(e^{\frac{2x-4}{2x+1}}\right) = \frac{10e^{\frac{2(x-2)}{2x+1}}}{(2x+1)^2}$$

$$(1.5) \quad D\left(\frac{1}{\log 2 + x^2}\right) = \frac{-2x}{(\log 2 + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{x} dx = \log|x| + c$$

$$(2.2) \quad \int \cos(6x) dx = \frac{1}{6} \operatorname{sen}(6x) + c$$

$$(2.3) \quad \int e^x \operatorname{sen}(e^x) dx = -\cos(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(4x^9 - 6x^8 + 5x^4 - 11x) = 36x^8 - 48x^7 + 20x^3 - 11$$

$$(1.2) \quad D\left(\frac{e^x}{x + \operatorname{sen}x}\right) = \frac{e^x(x + \operatorname{sen}x - \cos x - 1)}{(x + \operatorname{sen}x)^2}$$

$$(1.3) \quad D(\log(5x^2 + 9x - 3)) = \frac{10x + 9}{5x^2 + 9x - 3}$$

$$(1.4) \quad D\left(e^{\frac{2x+4}{3x+1}}\right) = -\frac{10e^{\frac{2(x+2)}{3x+1}}}{(3x+1)^2}$$

$$(1.5) \quad D\left(\frac{2x-3}{x^2+1}\right) = \frac{-2x^2 + 6x + 2}{(x^2+1)^2}$$

### 2. Determinare

$$(2.1) \quad \int \cos x \, dx = \operatorname{sen}x + c$$

$$(2.2) \quad \int \sqrt{5x} \, dx = \frac{2}{3}\sqrt{5}x^{3/2} + c$$

$$(2.3) \quad \int \frac{\cos x}{\cos^2(\operatorname{sen}x)} \, dx = \operatorname{tg}(\operatorname{sen}x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^7 + 4x^6 + 3x^3 - 11x^2) = 14x^6 + 24x^5 + 9x^2 - 22x = x(14x^5 + 24x^4 + 9x - 22)$$

$$(1.2) \quad D\left(\frac{e^x}{x + \cos x}\right) = \frac{e^x(x + \operatorname{sen} x + \cos x - 1)}{(x + \cos x)^2}$$

$$(1.3) \quad D(\log(6x^2 - 4x - 1)) = \frac{12x - 4}{6x^2 - 4x - 1}$$

$$(1.4) \quad D\left(e^{\frac{2x-4}{x+3}}\right) = \frac{10e^{\frac{2(x-2)}{x+3}}}{(x+3)^2}$$

$$(1.5) \quad D\left(\frac{\operatorname{sen} x}{e^{3x} + x^2}\right) = \frac{(e^{3x} + x^2) \cos x - (3e^{3x} + x^2) \operatorname{sen} x}{(e^{3x} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \operatorname{sen} x \, dx = -\cos x + c$$

$$(2.2) \quad \int \operatorname{sen}(7x) \, dx = -\frac{1}{7} \cos(7x) + c$$

$$(2.3) \quad \int \frac{\operatorname{sen} x}{\cos x} \, dx = -\log |\cos x| + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^6 + 3x^5 - x^4 + 2x^3) = 12x^5 + 15x^4 - 4x^3 + 6x^2 = x^2(12x^3 + 15x^2 - 4x + 6)$$

$$(1.2) \quad D\left(\frac{e^x}{x + \log x}\right) = \frac{e^x(x^2 - x + x \log x - 1)}{x(x + \log x)^2}$$

$$(1.3) \quad D(\log(7x^2 + 8x - 6)) = \frac{14x + 8}{7x^2 + 8x - 6}$$

$$(1.4) \quad D\left(e^{\frac{2x+4}{x+3}}\right) = \frac{2e^{\frac{2(x+2)}{x+3}}}{(x+3)^2}$$

$$(1.5) \quad D((7x^2 + x^5) \log(2 + e^x)) = (14x + 5x^4) \log(2 + e^x) + (7x^2 + x^5) \frac{e^x}{2 + e^x}$$

### 2. Determinare

$$(2.1) \quad \int e^x dx = e^x + c$$

$$(2.2) \quad \int \frac{1}{1 + 9x^2} dx = \frac{1}{3} \operatorname{arctg}(3x) + c$$

$$(2.3) \quad \int \frac{\cos(\log x)}{x} dx = \operatorname{sen}(\log x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(4x^5 + 2x^4 - 7x^3 + 2x) = 20x^4 + 8x^3 - 21x^2 + 2$$

$$(1.2) \quad D\left(\frac{\log x}{x + \operatorname{sen} x}\right) = \frac{\frac{x + \operatorname{sen} x}{x} - (\log x)(\cos x + 1)}{(x + \operatorname{sen} x)^2} = -\frac{-x + x \log x - \operatorname{sen} x + x \log x \cos x}{x(x + \operatorname{sen} x)^2}$$

$$(1.3) \quad D(\log(8x^2 + 3x - 7)) = \frac{16x + 3}{8x^2 + 3x - 7}$$

$$(1.4) \quad D\left(e^{\frac{4x+2}{x+2}}\right) = \frac{6e^{\frac{4x+2}{x+2}}}{(x+2)^2}$$

$$(1.5) \quad D\left(\operatorname{arctg}(e^{x^2} + x^2)\right) = \frac{2x(e^{x^2} + 1)}{1 + (e^{x^2} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{1+x^2} dx = \operatorname{arctg} x + c$$

$$(2.2) \quad \int \frac{1}{\sqrt{1-4x^2}} dx = \frac{1}{2} \operatorname{arcsen}(2x) + c$$

$$(2.3) \quad \int \operatorname{sen} x (e^{\cos x}) dx = -e^{\cos x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^7 + x^6 - 5x^4 - 9x) = 21x^6 + 6x^5 - 20x^3 - 9$$

$$(1.2) \quad D\left(\frac{\arcsen x}{x + e^x}\right) = \frac{\frac{x+e^x}{\sqrt{1-x^2}} - (e^x + 1) \arcsen x}{(x + e^x)^2} = -\frac{e^x \sqrt{1-x^2} \arcsen x + \sqrt{1-x^2} \arcsen x - x - e^x}{(x + e^x)^2 \sqrt{1-x^2}}$$

$$(1.3) \quad D(\log(9x^2 + 15x - 5)) = \frac{18x + 15}{9x^2 + 15x - 5}$$

$$(1.4) \quad D\left(e^{\frac{4x-2}{3x+1}}\right) = \frac{10e^{\frac{4x-2}{3x+1}}}{(3x+1)^2}$$

$$(1.5) \quad D(-x^2 + 2x^2 \log x) = 4x \log x$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\sqrt{1-x^2}} dx = \arcsen x + c$$

$$(2.2) \quad \int \frac{1}{\cos^2(3x)} dx = \frac{1}{3} \operatorname{tg}(3x) + c$$

$$(2.3) \quad \int \frac{e^x}{(e^x)^2 + 1} dx = \operatorname{arctg}(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(4x^6 + 2x^5 + 2x^3 - 6x) = 24x^5 + 10x^4 + 6x^2 - 6 = 2(12x^5 + 5x^4 + 3x^2 - 3)$$

$$(1.2) \quad D\left(\frac{\log x}{x + \cos x}\right) = \frac{x - x \log x + \cos x + x(\log x)\operatorname{sen}x}{x(x + \cos x)^2}$$

$$(1.3) \quad D(\log(x^2 + 4x - 12)) = \frac{2x + 4}{x^2 + 4x - 12}$$

$$(1.4) \quad D\left(e^{\frac{4x+2}{2x-1}}\right) = -\frac{8e^{\frac{4x+2}{2x-1}}}{(1-2x)^2}$$

$$(1.5) \quad D(e^{\operatorname{arctg}x}) = \frac{e^{\operatorname{arctg}x}}{1+x^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\cos^2 x} dx = \operatorname{tg}x + c$$

$$(2.2) \quad \int \sqrt{3x} dx = \frac{2}{3}\sqrt{3}x^{3/2} + c$$

$$(2.3) \quad \int \frac{1}{\sqrt{1-x^2}\operatorname{arcsen}x} dx = \log|\operatorname{arcsen}x| + c$$



## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^8 - 4x^7 + 3x^4 - 5) = 16x^7 - 28x^6 + 12x^3 = 4x^3(4x^4 - 7x^3 + 3)$$

$$(1.2) \quad D\left(\frac{\log x}{x + e^x}\right) = \frac{x + e^x - (e^x + 1)x \log x}{x(x + e^x)^2} = -\frac{-x - e^x + e^x x \log x + x \log x}{x(x + e^x)^2}$$

$$(1.3) \quad D(\log(2x^2 - 7x + 9)) = \frac{4x - 7}{2x^2 - 7x + 9}$$

$$(1.4) \quad D\left(e^{\frac{4x+2}{3x+1}}\right) = -\frac{2e^{\frac{4x+2}{3x+1}}}{(3x+1)^2}$$

$$(1.5) \quad D(\sqrt{\cos x + 2}) = \frac{-\operatorname{sen} x}{2\sqrt{\cos x + 2}}$$

### 2. Determinare

$$(2.1) \quad \int x^4 dx = \frac{x^5}{5} + c$$

$$(2.2) \quad \int \frac{1}{6x} dx = \frac{\log|x|}{6} + c$$

$$(2.3) \quad \int \frac{e^{\operatorname{tg} x}}{\cos^2 x} dx = e^{\operatorname{tg} x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^9 - 5x^8 + 4x^2 - 11) = 27x^8 - 40x^7 + 8x = x(27x^7 - 40x^6 + 8)$$

$$(1.2) \quad D\left(\frac{\log x}{x + \log x}\right) = \frac{1 - \log x}{(x + \log x)^2}$$

$$(1.3) \quad D(\log(3x^2 - 8x - 9)) = \frac{6x - 8}{3x^2 - 8x - 9}$$

$$(1.4) \quad D\left(e^{\frac{4x+2}{3x-1}}\right) = -\frac{10e^{\frac{4x+2}{3x-1}}}{(1-3x)^2}$$

$$(1.5) \quad D\left(\frac{1}{\log 2 + x^2}\right) = \frac{-2x}{(\log 2 + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{x} dx = \log|x| + c$$

$$(2.2) \quad \int \cos(9x) dx = \frac{1}{9}\sin(9x) + c$$

$$(2.3) \quad \int e^x \sin(e^x) dx = -\cos(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^7 + 2x^6 + 5x + 8) = 21x^6 + 12x^5 + 5$$

$$(1.2) \quad D\left(\frac{\arcsen x}{x + \log x}\right) = \frac{\frac{x + \log x}{\sqrt{1-x^2}} - \left(\frac{1}{x} + 1\right) \arcsen x}{(x + \log x)^2} = \frac{x^2 - \sqrt{1-x^2}x \arcsen x - \sqrt{1-x^2} \arcsen x + x \log x}{x\sqrt{1-x^2}(x + \log x)^2}$$

$$(1.3) \quad D(\log(4x^2 + 2x - 7)) = \frac{8x + 2}{4x^2 + 2x - 7}$$

$$(1.4) \quad D\left(e^{\frac{3x+4}{x+1}}\right) = -\frac{e^{\frac{3x+4}{x+1}}}{(x+1)^2}$$

$$(1.5) \quad D\left(\frac{2x-3}{x^2+1}\right) = \frac{-2x^2 + 6x + 2}{(x^2+1)^2}$$

### 2. Determinare

$$(2.1) \quad \int \cos x \, dx = \text{sen} x + c$$

$$(2.2) \quad \int \text{sen}(5x) \, dx = -\frac{1}{5} \cos(5x) + c$$

$$(2.3) \quad \int \frac{\cos x}{\cos^2(\text{sen} x)} \, dx = \text{tg}(\text{sen} x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(4x^4 + 7x^3 + x - 6) = 16x^3 + 21x^2 + 1$$

$$(1.2) \quad D\left(\frac{\operatorname{arctg}x}{x + \operatorname{sen}x}\right) = \frac{\frac{x + \operatorname{sen}x}{x^2 + 1} - (\cos x + 1)\operatorname{arctg}x}{(x + \operatorname{sen}x)^2}$$

$$(1.3) \quad D(\log(5x^2 - 8x - 8)) = \frac{10x - 8}{5x^2 - 8x - 8}$$

$$(1.4) \quad D\left(e^{\frac{4x+3}{x-1}}\right) = -\frac{7e^{\frac{4x+3}{x-1}}}{(x-1)^2}$$

$$(1.5) \quad D\left(\frac{\operatorname{sen}x}{e^{3x} + x^2}\right) = \frac{(e^{3x} + x^2)\cos x - (3e^{3x} + x^2)\operatorname{sen}x}{(e^{3x} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \operatorname{sen}x \, dx = -\cos x + c$$

$$(2.2) \quad \int \frac{1}{1 + 4x^2} \, dx = \frac{1}{2}\operatorname{arctg}(2x) + c$$

$$(2.3) \quad \int \frac{\operatorname{sen}x}{\cos x} \, dx = -\log|\cos x| + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^5 + 5x^4 + 8x^3 - 6x) = 15x^4 + 20x^3 + 24x^2 - 6$$

$$(1.2) \quad D\left(\frac{\operatorname{arctg}x}{x + \cos x}\right) = \frac{(x^2 + 1)(\operatorname{sen}x - 1)\operatorname{arctg}x + x + \cos x}{(x^2 + 1)(x + \cos x)^2}$$

$$(1.3) \quad D(\log(6x^2 - 6x - 7)) = \frac{12x - 6}{6x^2 - 6x - 7}$$

$$(1.4) \quad D\left(e^{\frac{3x+4}{x+2}}\right) = \frac{2e^{\frac{3x+4}{x+2}}}{(x+2)^2}$$

$$(1.5) \quad D((7x^2 + x^5)\log(2 + e^x)) = (14x + 5x^4)\log(2 + e^x) + (7x^2 + x^5)\frac{e^x}{2 + e^x}$$

### 2. Determinare

$$(2.1) \quad \int e^x dx = e^x + c$$

$$(2.2) \quad \int \frac{1}{\sqrt{1-9x^2}} dx = \frac{1}{3}\operatorname{arcsen}(3x) + c$$

$$(2.3) \quad \int \frac{\cos(\log x)}{x} dx = \operatorname{sen}(\log x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^6 - 3x^5 + 7x^2 - 16x) = 12x^5 - 15x^4 + 14x - 16$$

$$(1.2) \quad D\left(\frac{\cos x}{x + \arcsen x}\right) = -\frac{(x + \arcsen x) \operatorname{sen} x + \left(\frac{1}{\sqrt{1-x^2}} + 1\right) \cos x}{(x + \arcsen x)^2}$$

$$(1.3) \quad D(\log(7x^2 + 5x - 2)) = \frac{14x + 5}{7x^2 + 5x - 2}$$

$$(1.4) \quad D\left(e^{\frac{3x+4}{2x+1}}\right) = -\frac{5e^{\frac{3x+4}{2x+1}}}{(2x+1)^2}$$

$$(1.5) \quad D\left(\operatorname{arctg}(e^{x^2} + x^2)\right) = \frac{2x(e^{x^2} + 1)}{1 + (e^{x^2} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{1+x^2} dx = \operatorname{arctg} x + c$$

$$(2.2) \quad \int \frac{1}{\cos^2(7x)} dx = \frac{1}{7} \operatorname{tg}(7x) + c$$

$$(2.3) \quad \int \operatorname{sen} x (e^{\cos x}) dx = -e^{\cos x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^6 - 2x^4 + 9x^2 + 11x) = 18x^5 - 8x^3 + 18x + 11$$

$$(1.2) \quad D\left(\frac{\cos x}{x + \operatorname{arctg}x}\right) = -\frac{\left(\frac{1}{x^2+1} + 1\right) \cos x + \operatorname{sen}x (x + \operatorname{arctg}x)}{(x + \operatorname{arctg}x)^2}$$

$$(1.3) \quad D(\log(8x^2 + 4x - 1)) = \frac{16x + 4}{8x^2 + 4x - 1}$$

$$(1.4) \quad D\left(e^{\frac{3x-4}{x+1}}\right) = \frac{7e^{\frac{3x-4}{x+1}}}{(x+1)^2}$$

$$(1.5) \quad D(-x^2 + 2x^2 \log x) = 4x \log x$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\sqrt{1-x^2}} dx = \operatorname{arcsen}x + c$$

$$(2.2) \quad \int \sqrt{7x} dx = \frac{2}{3} \sqrt{7} x^{3/2} + c$$

$$(2.3) \quad \int \frac{e^x}{(e^x)^2 + 1} dx = \operatorname{arctg}(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^9 + 5x^7 - 7x^3 - 16) = 18x^8 + 35x^6 - 21x^2 = x^2(18x^6 + 35x^4 - 21)$$

$$(1.2) \quad D\left(\frac{\arctg x}{x + \arctg x}\right) = -\frac{x^2 \arctg x - x + \arctg x}{(x^2 + 1)(x + \arctg x)^2}$$

$$(1.3) \quad D(\log(9x^2 + 9x - 11)) = \frac{18x + 9}{9x^2 + 9x - 11}$$

$$(1.4) \quad D\left(e^{\frac{4x-3}{x-1}}\right) = -\frac{e^{\frac{4x-3}{x-1}}}{(x-1)^2}$$

$$(1.5) \quad D(e^{\arctg x}) = \frac{e^{\arctg x}}{1+x^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\cos^2 x} dx = \operatorname{tg} x + c$$

$$(2.2) \quad \int \frac{1}{5x} dx = \frac{\log|x|}{5} + c$$

$$(2.3) \quad \int \frac{1}{\sqrt{1-x^2} \arcsen x} dx = \log|\arcsen x| + c$$



## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^7 + 2x^5 + 6x^4 + 4x^2) = 21x^6 + 10x^4 + 24x^3 + 8x = x(21x^5 + 10x^3 + 24x^2 + 8)$$

$$(1.2) \quad D\left(\frac{\arctg x}{x + e^x}\right) = \frac{\frac{x+e^x}{x^2+1} - (e^x + 1)\arctg x}{(x + e^x)^2} = -\frac{e^x x^2 \arctg x + x^2 \arctg x - x - e^x + e^x \arctg x + \arctg x}{(x + e^x)^2 (x^2 + 1)}$$

$$(1.3) \quad D(\log(2x^2 + 15x - 7)) = \frac{4x + 15}{2x^2 + 15x - 7}$$

$$(1.4) \quad D\left(e^{\frac{3x-4}{x+2}}\right) = \frac{10e^{\frac{3x-4}{x+2}}}{(x+2)^2}$$

$$(1.5) \quad D(\sqrt{\cos x + 2}) = \frac{-\operatorname{sen} x}{2\sqrt{\cos x + 2}}$$

### 2. Determinare

$$(2.1) \quad \int x^4 dx = \frac{x^5}{5} + c$$

$$(2.2) \quad \int \cos(8x) dx = \frac{1}{8}\operatorname{sen}(8x) + c$$

$$(2.3) \quad \int \frac{e^{\operatorname{tg} x}}{\cos^2 x} dx = e^{\operatorname{tg} x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(6x^6 - 3x^4 - 8x^2 + 2x) = 36x^5 - 12x^3 - 16x + 2 = 2(18x^5 - 6x^3 - 8x + 1)$$

$$(1.2) \quad D\left(\frac{\cos x}{x + \operatorname{sen} x}\right) = -\frac{\operatorname{sen}^2 x + x \operatorname{sen} x + \cos^2 x + \cos x}{(x + \operatorname{sen} x)^2} = -\frac{x \operatorname{sen} x + \cos x + 1}{(x + \operatorname{sen} x)^2}$$

$$(1.3) \quad D(\log(3x^2 + 8x - 8)) = \frac{6x + 8}{3x^2 + 8x - 8}$$

$$(1.4) \quad D\left(e^{\frac{3x-4}{2x-1}}\right) = \frac{5e^{\frac{4-3x}{1-2x}}}{(1-2x)^2}$$

$$(1.5) \quad D\left(\frac{1}{\log 2 + x^2}\right) = \frac{-2x}{(\log 2 + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{x} dx = \log|x| + c$$

$$(2.2) \quad \int \operatorname{sen}(3x) dx = -\frac{1}{3} \cos(3x) + c$$

$$(2.3) \quad \int e^x \operatorname{sen}(e^x) dx = -\cos(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^5 + 2x^3 - 4x^2 + 5) = 15x^4 + 6x^2 - 8x$$

$$(1.2) \quad D\left(\frac{\cos x}{x + e^x}\right) = -\frac{e^x \operatorname{sen} x + x \operatorname{sen} x + e^x \cos x + \cos x}{(x + e^x)^2} = -\frac{(x + e^x) \operatorname{sen} x + (e^x + 1) \cos x}{(x + e^x)^2}$$

$$(1.3) \quad D(\log(4x^2 + 9x - 8)) = \frac{8x + 9}{4x^2 + 9x - 8}$$

$$(1.4) \quad D\left(e^{\frac{3x-4}{x+4}}\right) = \frac{16e^{\frac{3x-4}{x+4}}}{(x+4)^2}$$

$$(1.5) \quad D\left(\frac{2x-3}{x^2+1}\right) = \frac{-2x^2 + 6x + 2}{(x^2+1)^2}$$

### 2. Determinare

$$(2.1) \quad \int \cos x \, dx = \operatorname{sen} x + c$$

$$(2.2) \quad \int \frac{1}{1+16x^2} \, dx = \frac{1}{4} \operatorname{arctg}(4x) + c$$

$$(2.3) \quad \int \frac{\cos x}{\cos^2(\operatorname{sen} x)} \, dx = \operatorname{tg}(\operatorname{sen} x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^8 + 2x^5 - 4x^3 - 3) = 16x^7 + 10x^4 - 12x^2$$

$$(1.2) \quad D\left(\frac{\operatorname{sen} x}{x + \log x}\right) = \frac{(x + \log x) \cos x - \left(\frac{1}{x} + 1\right) \operatorname{sen} x}{(x + \log x)^2} = \frac{x^2 \cos x - x \operatorname{sen} x - \operatorname{sen} x + x \log x \cos x}{x(x + \log x)^2}$$

$$(1.3) \quad D(\log(5x^2 + x - 1)) = \frac{10x + 1}{5x^2 + x - 1}$$

$$(1.4) \quad D\left(e^{\frac{4x-3}{2x+1}}\right) = \frac{10e^{\frac{4x-3}{2x+1}}}{(2x+1)^2}$$

$$(1.5) \quad D\left(\frac{\operatorname{sen} x}{e^{3x} + x^2}\right) = \frac{(e^{3x} + x^2) \cos x - (3e^{3x} + x^2) \operatorname{sen} x}{(e^{3x} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \operatorname{sen} x \, dx = -\cos x + c$$

$$(2.2) \quad \int \frac{1}{\sqrt{1-25x^2}} \, dx = \frac{1}{5} \operatorname{arcsen}(5x) + c$$

$$(2.3) \quad \int \frac{\operatorname{sen} x}{\cos x} \, dx = -\log |\cos x| + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^6 - 4x^4 + 6x^2 - 9) = 18x^5 - 16x^3 + 12x = 2x(9x^4 - 8x^2 + 6)$$

$$(1.2) \quad D\left(\frac{\operatorname{sen} x}{x + e^x}\right) = \frac{-e^x \operatorname{sen} x - \operatorname{sen} x + e^x \cos x + x \cos x}{(x + e^x)^2} = \frac{(x + e^x) \cos x - (e^x + 1) \operatorname{sen} x}{(x + e^x)^2}$$

$$(1.3) \quad D(\log(6x^2 + 5x - 3)) = \frac{12x + 5}{6x^2 + 5x - 3}$$

$$(1.4) \quad D\left(e^{\frac{2x+3}{4x+5}}\right) = -\frac{2e^{\frac{2x+3}{4x+5}}}{(4x+5)^2}$$

$$(1.5) \quad D((7x^2 + x^5) \log(2 + e^x)) = (14x + 5x^4) \log(2 + e^x) + (7x^2 + x^5) \frac{e^x}{2 + e^x}$$

### 2. Determinare

$$(2.1) \quad \int e^x dx = e^x + c$$

$$(2.2) \quad \int \frac{1}{\cos^2(4x)} dx = \frac{1}{4} \operatorname{tg}(4x) + c$$

$$(2.3) \quad \int \frac{\cos(\log x)}{x} dx = \operatorname{sen}(\log x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^9 + 3x^6 - 2x^4 - 2) = 18x^8 + 18x^5 - 8x^3 = 2x^3(9x^5 + 9x^2 - 4)$$

$$(1.2) \quad D\left(\frac{e^x}{x + \operatorname{sen}x}\right) = \frac{e^x(x + \operatorname{sen}x - \cos x - 1)}{(x + \operatorname{sen}x)^2}$$

$$(1.3) \quad D(\log(7x^2 + 7x - 6)) = \frac{14x + 7}{7x^2 + 7x - 6}$$

$$(1.4) \quad D\left(e^{\frac{2x-3}{5x+4}}\right) = \frac{23e^{\frac{2x-3}{5x+4}}}{(5x+4)^2}$$

$$(1.5) \quad D\left(\operatorname{arctg}(e^{x^2} + x^2)\right) = \frac{2x(e^{x^2} + 1)}{1 + (e^{x^2} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{1+x^2} dx = \operatorname{arctg}x + c$$

$$(2.2) \quad \int \frac{1}{8x} dx = \frac{\log|x|}{8} + c$$

$$(2.3) \quad \int \operatorname{sen}x (e^{\cos x}) dx = -e^{\cos x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^8 - x^7 + 5x^2 - 9) = 24x^7 - 7x^6 + 10x = x(24x^6 - 7x^5 + 10)$$

$$(1.2) \quad D\left(\frac{e^x}{x + \cos x}\right) = \frac{e^x(x + \operatorname{sen} x + \cos x - 1)}{(x + \cos x)^2}$$

$$(1.3) \quad D(\log(3x^2 + 5x - 2)) = \frac{6x + 5}{3x^2 + 5x - 2}$$

$$(1.4) \quad D\left(e^{\frac{2x+3}{5-4x}}\right) = \frac{22e^{\frac{2x+3}{5-4x}}}{(5-4x)^2}$$

$$(1.5) \quad D(-x^2 + 2x^2 \log x) = 4x \log x$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\sqrt{1-x^2}} dx = \operatorname{arcsen} x + c$$

$$(2.2) \quad \int \cos(6x) dx = \frac{1}{6} \operatorname{sen}(6x) + c$$

$$(2.3) \quad \int \frac{e^x}{(e^x)^2 + 1} dx = \operatorname{arctg}(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(x^9 - 2x^8 - 4x^3 + 12) = 9x^8 - 16x^7 - 12x^2 = x^2(9x^6 - 16x^5 - 12)$$

$$(1.2) \quad D\left(\frac{e^x}{x + \log x}\right) = \frac{e^x(x^2 - x + x \log x - 1)}{x(x + \log x)^2}$$

$$(1.3) \quad D(\log(5x^2 + 4x - 7)) = \frac{10x + 4}{5x^2 + 4x - 7}$$

$$(1.4) \quad D\left(e^{\frac{2x+3}{x+3}}\right) = \frac{3e^{\frac{2x+3}{x+3}}}{(x+3)^2}$$

$$(1.5) \quad D(e^{\arctg x}) = \frac{e^{\arctg x}}{1+x^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\cos^2 x} dx = \operatorname{tg} x + c$$

$$(2.2) \quad \int \sqrt{5x} dx = \frac{2}{3}\sqrt{5}x^{3/2} + c$$

$$(2.3) \quad \int \frac{1}{\sqrt{1-x^2}\arcsen x} dx = \log |\arcsen x| + c$$



## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^7 - 6x^5 - x^4 - 6) = 14x^6 - 30x^4 - 4x^3 = 2x^3(7x^3 - 15x - 2)$$

$$(1.2) \quad D\left(\frac{\log x}{x + \operatorname{sen} x}\right) = \frac{\frac{x + \operatorname{sen} x}{x} - (\log x)(\cos x + 1)}{(x + \operatorname{sen} x)^2} = -\frac{-x + x \log x - \operatorname{sen} x + x \log x \cos x}{x(x + \operatorname{sen} x)^2}$$

$$(1.3) \quad D(\log(8x^2 - 3x - 9)) = \frac{16x - 3}{8x^2 - 3x - 9}$$

$$(1.4) \quad D\left(e^{\frac{2x+3}{x-3}}\right) = -\frac{9e^{\frac{2x+3}{x-3}}}{(x-3)^2}$$

$$(1.5) \quad D(\sqrt{\cos x + 2}) = \frac{-\operatorname{sen} x}{2\sqrt{\cos x + 2}}$$

### 2. Determinare

$$(2.1) \quad \int x^4 dx = \frac{x^5}{5} + c$$

$$(2.2) \quad \int \operatorname{sen}(7x) dx = -\frac{1}{7} \cos(7x) + c$$

$$(2.3) \quad \int \frac{e^{\operatorname{tg} x}}{\cos^2 x} dx = e^{\operatorname{tg} x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^4 - 5x^3 - 6x^2 - 5) = 8x^3 - 15x^2 - 12x = x(8x^2 - 15x - 12)$$

$$(1.2) \quad D\left(\frac{\arcsen x}{x + e^x}\right) = \frac{\frac{x+e^x}{\sqrt{1-x^2}} - (e^x + 1) \arcsen x}{(x + e^x)^2} = -\frac{e^x \sqrt{1-x^2} \arcsen x + \sqrt{1-x^2} \arcsen x - x - e^x}{(x + e^x)^2 \sqrt{1-x^2}}$$

$$(1.3) \quad D(\log(7x^2 + 2x - 5)) = \frac{14x + 2}{7x^2 + 2x - 5}$$

$$(1.4) \quad D\left(e^{\frac{3x+2}{4x+5}}\right) = \frac{7e^{\frac{3x+2}{4x+5}}}{(4x+5)^2}$$

$$(1.5) \quad D\left(\frac{1}{\log 2 + x^2}\right) = \frac{-2x}{(\log 2 + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{x} dx = \log|x| + c$$

$$(2.2) \quad \int \frac{1}{1+9x^2} dx = \frac{1}{3} \operatorname{arctg}(3x) + c$$

$$(2.3) \quad \int e^x \operatorname{sen}(e^x) dx = -\cos(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(5x^6 - 5x^5 + 4x^3 + 8) = 30x^5 - 25x^4 + 12x^2 = x^2(30x^3 - 25x^2 + 12)$$

$$(1.2) \quad D\left(\frac{\log x}{x + \cos x}\right) = \frac{x - x \log x + \cos x + x(\log x)\operatorname{sen}x}{x(x + \cos x)^2}$$

$$(1.3) \quad D(\log(6x^2 - 4x + 7)) = \frac{12x - 4}{6x^2 - 4x + 7}$$

$$(1.4) \quad D\left(e^{\frac{3x-2}{5x+4}}\right) = \frac{22e^{\frac{3x-2}{5x+4}}}{(5x+4)^2}$$

$$(1.5) \quad D\left(\frac{2x-3}{x^2+1}\right) = \frac{-2x^2 + 6x + 2}{(x^2+1)^2}$$

### 2. Determinare

$$(2.1) \quad \int \cos x \, dx = \operatorname{sen}x + c$$

$$(2.2) \quad \int \frac{1}{\sqrt{1-4x^2}} \, dx = \frac{1}{2} \operatorname{arcsen}(2x) + c$$

$$(2.3) \quad \int \frac{\cos x}{\cos^2(\operatorname{sen}x)} \, dx = \operatorname{tg}(\operatorname{sen}x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^7 + x^6 + 2x^5 - 1) = 21x^6 + 6x^5 + 10x^4 = x^4(21x^2 + 6x + 10)$$

$$(1.2) \quad D\left(\frac{\log x}{x + e^x}\right) = \frac{x + e^x - (e^x + 1)x \log x}{x(x + e^x)^2} = -\frac{-x - e^x + e^x x \log x + x \log x}{x(x + e^x)^2}$$

$$(1.3) \quad D(\log(7x^2 - 3x - 12)) = \frac{14x - 3}{7x^2 - 3x - 12}$$

$$(1.4) \quad D\left(e^{\frac{3x+2}{-4x+5}}\right) = \frac{23e^{\frac{3x+2}{5-4x}}}{(5-4x)^2}$$

$$(1.5) \quad D\left(\frac{\operatorname{sen} x}{e^{3x} + x^2}\right) = \frac{(e^{3x} + x^2) \cos x - (3e^{3x} + x^2) \operatorname{sen} x}{(e^{3x} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \operatorname{sen} x \, dx = -\cos x + c$$

$$(2.2) \quad \int \frac{1}{\cos^2(3x)} \, dx = \frac{1}{3} \operatorname{tg}(3x) + c$$

$$(2.3) \quad \int \frac{\operatorname{sen} x}{\cos x} \, dx = -\log |\cos x| + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^8 - x^4 + 3x^3 - 11) = 16x^7 - 4x^3 + 9x^2 = x^2(16x^5 - 4x + 9)$$

$$(1.2) \quad D\left(\frac{\log x}{x + \log x}\right) = \frac{1 - \log x}{(x + \log x)^2}$$

$$(1.3) \quad D(\log(6x^2 + 4x - 5)) = \frac{12x + 4}{6x^2 + 4x - 5}$$

$$(1.4) \quad D\left(e^{\frac{3x+2}{3x+1}}\right) = -\frac{3e^{\frac{3x+2}{3x+1}}}{(3x+1)^2}$$

$$(1.5) \quad D((7x^2 + x^5)\log(2 + e^x)) = (14x + 5x^4)\log(2 + e^x) + (7x^2 + x^5)\frac{e^x}{2 + e^x}$$

### 2. Determinare

$$(2.1) \quad \int e^x dx = e^x + c$$

$$(2.2) \quad \int \sqrt{3x} dx = \frac{2}{3}\sqrt{3}x^{3/2} + c$$

$$(2.3) \quad \int \frac{\cos(\log x)}{x} dx = \sin(\log x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(4x^7 - 3x^6 + 2x^5 - 6x) = 28x^6 - 18x^5 + 10x^4 - 6 = 2(14x^6 - 9x^5 + 5x^4 - 3)$$

$$(1.2) \quad D\left(\frac{\arcsen x}{x + \log x}\right) = \frac{\frac{x + \log x}{\sqrt{1-x^2}} - \left(\frac{1}{x} + 1\right) \arcsen x}{(x + \log x)^2} = \frac{x^2 - \sqrt{1-x^2}x \arcsen x - \sqrt{1-x^2} \arcsen x + x \log x}{x\sqrt{1-x^2}(x + \log x)^2}$$

$$(1.3) \quad D(\log(x^2 + 15x - 8)) = \frac{2x + 15}{x^2 + 15x - 8}$$

$$(1.4) \quad D\left(e^{\frac{3x+2}{x-3}}\right) = -\frac{11e^{\frac{3x+2}{x-3}}}{(x-3)^2}$$

$$(1.5) \quad D\left(\arctg(e^{x^2} + x^2)\right) = \frac{2x(e^{x^2} + 1)}{1 + (e^{x^2} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{1+x^2} dx = \arctg x + c$$

$$(2.2) \quad \int \frac{1}{6x} dx = \frac{\log|x|}{6} + c$$

$$(2.3) \quad \int \operatorname{sen} x (e^{\cos x}) dx = -e^{\cos x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^5 - 2x^4 + 4x^2 - 7x) = 15x^4 - 8x^3 + 8x - 7$$

$$(1.2) \quad D\left(\frac{\operatorname{arctg}x}{x + \operatorname{sen}x}\right) = \frac{\frac{x+\operatorname{sen}x}{x^2+1} - (\cos x + 1)\operatorname{arctg}x}{(x + \operatorname{sen}x)^2}$$

$$(1.3) \quad D(\log(2x^2 + 4x - 7)) = \frac{4x + 4}{2x^2 + 4x - 7}$$

$$(1.4) \quad D\left(e^{\frac{2x+4}{x+5}}\right) = \frac{6e^{\frac{2(x+2)}{x+5}}}{(x+5)^2}$$

$$(1.5) \quad D(-x^2 + 2x^2 \log x) = 4x \log x$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\sqrt{1-x^2}} dx = \operatorname{arcsen}x + c$$

$$(2.2) \quad \int \cos(9x) dx = \frac{1}{9}\operatorname{sen}(9x) + c$$

$$(2.3) \quad \int \frac{e^x}{(e^x)^2 + 1} dx = \operatorname{arctg}(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(4x^9 - 6x^8 + 5x^4 - 11x) = 36x^8 - 48x^7 + 20x^3 - 11$$

$$(1.2) \quad D\left(\frac{\operatorname{arctg}x}{x + \cos x}\right) = \frac{(x^2 + 1)(\operatorname{sen}x - 1)\operatorname{arctg}x + x + \cos x}{(x^2 + 1)(x + \cos x)^2}$$

$$(1.3) \quad D(\log(3x^2 + 9x - 7)) = \frac{6x + 9}{3x^2 + 9x - 7}$$

$$(1.4) \quad D\left(e^{\frac{2x-4}{2x+1}}\right) = \frac{10e^{\frac{2(x-2)}{2x+1}}}{(2x+1)^2}$$

$$(1.5) \quad D(e^{\operatorname{arctg}x}) = \frac{e^{\operatorname{arctg}x}}{1+x^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\cos^2 x} dx = \operatorname{tg}x + c$$

$$(2.2) \quad \int \operatorname{sen}(5x) dx = -\frac{1}{5} \cos(5x) + c$$

$$(2.3) \quad \int \frac{1}{\sqrt{1-x^2}\operatorname{arcsen}x} dx = \log|\operatorname{arcsen}x| + c$$



## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^7 + 4x^6 + 3x^3 - 11x^2) = 14x^6 + 24x^5 + 9x^2 - 22x = x(14x^5 + 24x^4 + 9x - 22)$$

$$(1.2) \quad D\left(\frac{\cos x}{x + \arcsen x}\right) = -\frac{(x + \arcsen x) \operatorname{sen} x + \left(\frac{1}{\sqrt{1-x^2}} + 1\right) \cos x}{(x + \arcsen x)^2}$$

$$(1.3) \quad D(\log(4x^2 - 7x - 6)) = \frac{8x - 7}{4x^2 - 7x - 6}$$

$$(1.4) \quad D\left(e^{\frac{2x+4}{3x+1}}\right) = -\frac{10e^{\frac{2(x+2)}{3x+1}}}{(3x+1)^2}$$

$$(1.5) \quad D(\sqrt{\cos x + 2}) = \frac{-\operatorname{sen} x}{2\sqrt{\cos x + 2}}$$

### 2. Determinare

$$(2.1) \quad \int x^4 dx = \frac{x^5}{5} + c$$

$$(2.2) \quad \int \frac{1}{1+4x^2} dx = \frac{1}{2} \operatorname{arctg}(2x) + c$$

$$(2.3) \quad \int \frac{e^{\operatorname{tg} x}}{\cos^2 x} dx = e^{\operatorname{tg} x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^6 + 3x^5 - x^4 + 2x^3) = 12x^5 + 15x^4 - 4x^3 + 6x^2 = x^2(12x^3 + 15x^2 - 4x + 6)$$

$$(1.2) \quad D\left(\frac{\cos x}{x + \operatorname{arctg}x}\right) = -\frac{\left(\frac{1}{x^2+1} + 1\right)\cos x + \operatorname{sen}x(x + \operatorname{arctg}x)}{(x + \operatorname{arctg}x)^2}$$

$$(1.3) \quad D(\log(5x^2 + 9x - 3)) = \frac{10x + 9}{5x^2 + 9x - 3}$$

$$(1.4) \quad D\left(e^{\frac{2x-4}{x+3}}\right) = \frac{10e^{\frac{2(x-2)}{x+3}}}{(x+3)^2}$$

$$(1.5) \quad D\left(\frac{1}{\log 2 + x^2}\right) = \frac{-2x}{(\log 2 + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{x} dx = \log|x| + c$$

$$(2.2) \quad \int \frac{1}{\sqrt{1-9x^2}} dx = \frac{1}{3}\operatorname{arcsen}(3x) + c$$

$$(2.3) \quad \int e^x \operatorname{sen}(e^x) dx = -\cos(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(4x^5 + 2x^4 - 7x^3 + 2x) = 20x^4 + 8x^3 - 21x^2 + 2$$

$$(1.2) \quad D\left(\frac{\operatorname{arctg}x}{x + \operatorname{arctg}x}\right) = -\frac{x^2 \operatorname{arctg}x - x + \operatorname{arctg}x}{(x^2 + 1)(x + \operatorname{arctg}x)^2}$$

$$(1.3) \quad D(\log(6x^2 - 4x - 1)) = \frac{12x - 4}{6x^2 - 4x - 1}$$

$$(1.4) \quad D\left(e^{\frac{2x+4}{x+3}}\right) = \frac{2e^{\frac{2(x+2)}{x+3}}}{(x+3)^2}$$

$$(1.5) \quad D\left(\frac{2x-3}{x^2+1}\right) = \frac{-2x^2 + 6x + 2}{(x^2+1)^2}$$

### 2. Determinare

$$(2.1) \quad \int \cos x \, dx = \operatorname{sen}x + c$$

$$(2.2) \quad \int \frac{1}{\cos^2(7x)} \, dx = \frac{1}{7} \operatorname{tg}(7x) + c$$

$$(2.3) \quad \int \frac{\cos x}{\cos^2(\operatorname{sen}x)} \, dx = \operatorname{tg}(\operatorname{sen}x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^7 + x^6 - 5x^4 - 9x) = 21x^6 + 6x^5 - 20x^3 - 9$$

$$(1.2) \quad D\left(\frac{\arctg x}{x + e^x}\right) = \frac{\frac{x+e^x}{x^2+1} - (e^x + 1) \arctg x}{(x + e^x)^2} = -\frac{e^x x^2 \arctg x + x^2 \arctg x - x - e^x + e^x \arctg x + \arctg x}{(x + e^x)^2 (x^2 + 1)}$$

$$(1.3) \quad D(\log(7x^2 + 8x - 6)) = \frac{14x + 8}{7x^2 + 8x - 6}$$

$$(1.4) \quad D\left(e^{\frac{4x+2}{x+2}}\right) = \frac{6e^{\frac{4x+2}{x+2}}}{(x+2)^2}$$

$$(1.5) \quad D\left(\frac{\operatorname{sen} x}{e^{3x} + x^2}\right) = \frac{(e^{3x} + x^2) \cos x - (3e^{3x} + x^2) \operatorname{sen} x}{(e^{3x} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \operatorname{sen} x \, dx = -\cos x + c$$

$$(2.2) \quad \int \sqrt{7x} \, dx = \frac{2}{3} \sqrt{7} x^{3/2} + c$$

$$(2.3) \quad \int \frac{\operatorname{sen} x}{\cos x} \, dx = -\log |\cos x| + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(4x^6 + 2x^5 + 2x^3 - 6x) = 24x^5 + 10x^4 + 6x^2 - 6 = 2(12x^5 + 5x^4 + 3x^2 - 3)$$

$$(1.2) \quad D\left(\frac{\cos x}{x + \operatorname{sen} x}\right) = -\frac{\operatorname{sen}^2 x + x \operatorname{sen} x + \cos^2 x + \cos x}{(x + \operatorname{sen} x)^2} = -\frac{x \operatorname{sen} x + \cos x + 1}{(x + \operatorname{sen} x)^2}$$

$$(1.3) \quad D(\log(8x^2 + 3x - 7)) = \frac{16x + 3}{8x^2 + 3x - 7}$$

$$(1.4) \quad D\left(e^{\frac{4x-2}{3x+1}}\right) = \frac{10e^{\frac{4x-2}{3x+1}}}{(3x+1)^2}$$

$$(1.5) \quad D((7x^2 + x^5) \log(2 + e^x)) = (14x + 5x^4) \log(2 + e^x) + (7x^2 + x^5) \frac{e^x}{2 + e^x}$$

### 2. Determinare

$$(2.1) \quad \int e^x dx = e^x + c$$

$$(2.2) \quad \int \frac{1}{5x} dx = \frac{\log|x|}{5} + c$$

$$(2.3) \quad \int \frac{\cos(\log x)}{x} dx = \operatorname{sen}(\log x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(2x^8 - 4x^7 + 3x^4 - 5) = 16x^7 - 28x^6 + 12x^3 = 4x^3(4x^4 - 7x^3 + 3)$$

$$(1.2) \quad D\left(\frac{\cos x}{x + e^x}\right) = -\frac{e^x \operatorname{sen} x + x \operatorname{sen} x + e^x \cos x + \cos x}{(x + e^x)^2} = -\frac{(x + e^x) \operatorname{sen} x + (e^x + 1) \cos x}{(x + e^x)^2}$$

$$(1.3) \quad D(\log(9x^2 + 15x - 5)) = \frac{18x + 15}{9x^2 + 15x - 5}$$

$$(1.4) \quad D\left(e^{\frac{4x+2}{2x-1}}\right) = -\frac{8e^{\frac{4x+2}{2x-1}}}{(1-2x)^2}$$

$$(1.5) \quad D\left(\operatorname{arctg}(e^{x^2} + x^2)\right) = \frac{2x(e^{x^2} + 1)}{1 + (e^{x^2} + x^2)^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{1+x^2} dx = \operatorname{arctg} x + c$$

$$(2.2) \quad \int \cos(8x) dx = \frac{1}{8} \operatorname{sen}(8x) + c$$

$$(2.3) \quad \int \operatorname{sen} x (e^{\cos x}) dx = -e^{\cos x} + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^9 - 5x^8 + 4x^2 - 11) = 27x^8 - 40x^7 + 8x = x(27x^7 - 40x^6 + 8)$$

$$(1.2) \quad D\left(\frac{\operatorname{sen} x}{x + \log x}\right) = \frac{(x + \log x) \cos x - \left(\frac{1}{x} + 1\right) \operatorname{sen} x}{(x + \log x)^2} = \frac{x^2 \cos x - x \operatorname{sen} x - \operatorname{sen} x + x \log x \cos x}{x(x + \log x)^2}$$

$$(1.3) \quad D(\log(x^2 + 4x - 12)) = \frac{2x + 4}{x^2 + 4x - 12}$$

$$(1.4) \quad D\left(e^{\frac{4x+2}{3x+1}}\right) = -\frac{2e^{\frac{4x+2}{3x+1}}}{(3x+1)^2}$$

$$(1.5) \quad D(-x^2 + 2x^2 \log x) = 4x \log x$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\sqrt{1-x^2}} dx = \operatorname{arcsen} x + c$$

$$(2.2) \quad \int \operatorname{sen}(3x) dx = -\frac{1}{3} \cos(3x) + c$$

$$(2.3) \quad \int \frac{e^x}{(e^x)^2 + 1} dx = \operatorname{arctg}(e^x) + c$$

## ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

### 1. Calcolare

$$(1.1) \quad D(3x^7 + 2x^6 + 5x + 8) = 21x^6 + 12x^5 + 5$$

$$(1.2) \quad D\left(\frac{\operatorname{sen} x}{x + e^x}\right) = \frac{-e^x \operatorname{sen} x - \operatorname{sen} x + e^x \cos x + x \cos x}{(x + e^x)^2} = \frac{(x + e^x) \cos x - (e^x + 1) \operatorname{sen} x}{(x + e^x)^2}$$

$$(1.3) \quad D(\log(2x^2 - 7x + 9)) = \frac{4x - 7}{2x^2 - 7x + 9}$$

$$(1.4) \quad D\left(e^{\frac{4x+2}{3x-1}}\right) = -\frac{10e^{\frac{4x+2}{3x-1}}}{(1-3x)^2}$$

$$(1.5) \quad D(e^{\operatorname{arctg} x}) = \frac{e^{\operatorname{arctg} x}}{1+x^2}$$

### 2. Determinare

$$(2.1) \quad \int \frac{1}{\cos^2 x} dx = \operatorname{tg} x + c$$

$$(2.2) \quad \int \frac{1}{1+16x^2} dx = \frac{1}{4} \operatorname{arctg}(4x) + c$$

$$(2.3) \quad \int \frac{1}{\sqrt{1-x^2} \operatorname{arcsen} x} dx = \log |\operatorname{arcsen} x| + c$$



ESERCITAZIONE DEL 19 DICEMBRE 2018

NOME:

COGNOME:

MATRICOLA:

1. Calcolare

$$(1.1) \quad D(4x^4 + 7x^3 + x - 6) = 16x^3 + 21x^2 + 1$$

$$(1.2) \quad D\left(\frac{e^x}{x + \operatorname{sen}x}\right) = \frac{e^x(x + \operatorname{sen}x - \cos x - 1)}{(x + \operatorname{sen}x)^2}$$

$$(1.3) \quad D(\log(3x^2 - 8x - 9)) = \frac{6x - 8}{3x^2 - 8x - 9}$$

$$(1.4) \quad D\left(e^{\frac{3x+4}{x+1}}\right) = -\frac{e^{\frac{3x+4}{x+1}}}{(x+1)^2}$$

$$(1.5) \quad D(\sqrt{\cos x + 2}) = \frac{-\operatorname{sen}x}{2\sqrt{\cos x + 2}}$$

2. Determinare

$$(2.1) \quad \int x^4 dx = \frac{x^5}{5} + c$$

$$(2.2) \quad \int \frac{1}{\sqrt{1 - 25x^2}} dx = \frac{1}{5} \operatorname{arcsen}(5x) + c$$

$$(2.3) \quad \int \frac{e^{\operatorname{tg}x}}{\cos^2 x} dx = e^{\operatorname{tg}x} + c$$