Integrali indefiniti immediati

- $\int x^\alpha \, dx = \frac{x^{\alpha+1}}{\alpha+1} + c$ per $\alpha \neq -1$ ($x > 0$ se α non è intero)
- $\int \frac{1}{x} \, dx = \log|x|$ $(x \neq 0)$
- $\int a^x \, dx = a^x \log_a e + c$ $(a > 0)$
- $\int e^x \, dx = e^x + c$
- $\int \cos x \, dx = \sin x + c$
- $\int \sin x \, dx = -\cos x + c$
- $\int \frac{1}{\cos^2 x} \, dx = \tan x + c$ $(x \neq \frac{\pi}{2} + k\pi, k \in \mathbb{Z})$
- $\int \frac{1}{\sin^2 x} \, dx = -cotanx + c$ $(x \neq k\pi, k \in \mathbb{Z})$
- $\int \cosh x \, dx = \sinh x + c$
- $\int \sinh x \, dx = \cosh x + c$
- $\int \frac{1}{\cosh^x} \, dx = \tanh x + c$
- $\int \frac{1}{\sqrt{1-x^2}} \, dx = \arcsin x + c = -\arccos x + c'$
  $(-1 \leq x \geq 1; c' = c + \frac{\pi}{2})$
- $\int \frac{1}{1+x^2} \, dx = \arctan x + c$ $(c' = c + \frac{\pi}{2})$

Esercizi - Integrali riconducibili a integrali immediati

1. $\int (x^2 + x + 3)\, dx$
2. $\int \frac{1}{x^4}\, dx$
3. $\int x^2 \sqrt{x}\, dx$
4. $\int \frac{x^3+x^2+x}{x^2}\, dx$
5. $\int \frac{1}{x-1}\, dx$
6. $\int \frac{1}{x^2+4}\, dx$
7. $\int e^{3x}\, dx$
8. $\int \cos 2x\, dx$
9. $\int \frac{x+2}{x^2+4x+8}\, dx$
10. $\int \sin 4x\, dx$

Esercizi - Integrali riconducibili a integrali immediati

11. $\int \frac{1}{\sqrt{x+3}}\,dx$
12. $\int \frac{x}{\sqrt{4+x^2}}\,dx$
13. $\int \frac{\arcsin^2 x}{\sqrt{1-x^2}}\,dx$
14. $\int \frac{1}{x \log x}\,dx$
15. $\int \frac{e^x}{e^x+3}\,dx$
16. $\int (2x+1)^8\,dx$
17. $\int \frac{1}{\sqrt{2x-1}}\,dx$
18. $\int \sin^2 x\,dx$
19. $\int \cos^2 x\,dx$
20. $\int \frac{1}{1+\cos x}\,dx$

Esercizi - Integrali riconducibili a integrali immediati

21. $\int \left(\frac{x^2}{\sqrt{x}} - \frac{1}{x^2} + \sqrt[5]{x} + 2 \right) \, dx$
22. $\int \frac{\cos^3(x)+5}{\cos^2(x)} \, dx$
23. $\int \frac{x^2-1}{x^2+1} \, dx$
24. $\int x e^{-x^2} \, dx$
25. $\int (2x-3)^3 \, dx$
26. $\int \sqrt[4]{(x-2)^3} \, dx$
27. $\int x^2 \cos(x^3) \, dx$
28. $\int \cos(x) \sin^4(x) \, dx$
29. $\int \frac{x}{1+x^2} \, dx$

Esercizi - Integrali riconducibili a integrali immediati

30. $\int \left(\frac{2x}{\sqrt{1+x^2}} \right) dx$
31. $\int \frac{1-\cos(x)}{\sin^2(x)} dx$
32. $\int \sin(x) e^{\cos(x)} dx$
33. $\int \frac{e^x}{e^x+1} dx$
34. $\int \frac{1}{e^x+3} dx$
35. $\int \frac{(x+1)^2}{x^3} dx$ sull'intervallo $I = (0, +\infty)$
36. $\int \sqrt{\frac{1-x}{1+x}} dx$ sull'intervallo $(-1, 1)$
37. $\int \sin^3(x) dx$

Esercizi - Integrali riconducibili a integrali immediati

Ricordiamo

$$\cos(\alpha+\beta) = \cos(\alpha)\cos(\beta) - \sin(\alpha)\sin(\beta),$$
$$\cos(\alpha-\beta) = \cos(\alpha)\cos(\beta) + \sin(\alpha)\sin(\beta).$$

quindi

$$\sin(\alpha)\sin(\beta) = \frac{1}{2}\left(\cos(\alpha-\beta) - \cos(\alpha+\beta)\right)$$

38. $\int \sin(2x)\sin(5x)\,dx$
39. $\int \frac{3\sin^2(x)}{2+2\cos(x)}\,dx$ sull'intervallo $[0, \pi/2]$.
40. Sia f la primitiva di $g(x) = \frac{e^x}{\cosh(x)}$ tale che $f(0) = \ln(2)$. Calcolare $f(\ln(2))$.

Esercizi - Integrali riconducibili a integrali immediati

41. $\int_0^{\frac{\pi}{2}} |\sin x - \cos x|\, dx$
42. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} 2 \sin x \cos x\, dx$
43. $\lim_{x \to 0} \frac{5 \int_0^x \left(e^{-t^2} - \cos^2 t\right) dt}{x^5}$
44. $\int_0^{\frac{\pi}{2}} \sin^3 x \cos^2 x\, dx$
45. $\int_1^2 \frac{x+2}{x^{\frac{5}{2}}}\, dx$
46. $\int_0^1 \left(2x^{\frac{4}{3}} - \frac{4}{1+3x^2} + \sin 5x\right)\, dx$
47. $\int_0^{\frac{\pi}{2}} \frac{\cos^2 x + \sin 2x}{2 \cos x}\, dx$

Esercizi - Integrali riconducibili a integrali immediati

48. $\int_1^3 \frac{\ln(x)}{x}\,dx$
49. $\int_{2/\pi}^{3/\pi} \frac{1}{x^2}\sin\left(\frac{1}{x}\right)\,dx$
50. $\int_0^1 \frac{\sin(2x)}{7+\sin^2(x)}\,dx$
51. Calcolare l'area A compresa tra i grafici delle funzioni
$f(x) = x^2 - 2x + 1, \qquad g(x) = x + 1.$
52. $\int_1^4 |2 - x|\,dx$
53. $\int_{\pi}^{\frac{3}{2}\pi} \sqrt{1 + \cos(x)}\,dx$