Eserciziario di Analisi Matematica

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Indice

1 Derivate

1.

2 Integrali

1.

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

2.

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

3 Limiti

1. $$\lim_{x\to+\infty} \frac{x^4 - x^3 + 1}{\sqrt{x} + x^2 - x^3} = -\infty$$

2. $$\lim_{x\to 0} \frac{x^3 - x^2 + 4x}{x^5 - x} = -4$$

3. $$\lim_{x\to 1^+} \frac{x^4 - x^3 + 1}{1 - x^3} = \infty$$

4. $$\lim_{x\to 0} \frac{x \cdot \sin^2(8x)}{(1 - \cos(x)) \ln(1 + \tan(x))} = 128$$

5. $$\lim_{x\to 1} \frac{x^3 - 3x + 2}{x^2 - 6x + 5} = 0$$

6. $$\lim_{x\to 2} \frac{3 - \sqrt{5x - 1}}{4 - x^2} = \frac{5}{24}$$

7. $$\lim_{x\to+\infty} \frac{x^2 - 3x^4}{2x^2 - x + 4x^4} = -\frac{3}{4}$$

8. $$\lim_{x\to+\infty} \frac{x^2 - 2}{x^2 - 2x + 1} = 0$$

9. $$\lim_{x\to+\infty} \frac{x + \sqrt{x^2 + 8}}{2x + 1} = 1$$

10. $$\lim_{x\to-\infty} \frac{\sqrt[3]{3x^3 - 2x^2 + 5}}{2x + \sqrt{x^2 - 1}} = \sqrt[3]{3}$$

11. $$\lim_{x\to+\infty} \frac{2 + \cos(x)}{2x + \sin(x)} = 0$$

12. $$\lim_{x\to+\infty} \frac{2^x + (\frac{27}{10})^x}{x + e^x} = 0$$

13. $$\lim_{x\to+\infty} e^x - x^x = -\infty (x = e^{\ln(x)})$$

4 Equazioni differenziali

1.