PRIMITIVAS IMEDIATAS

1. Determine as seguintes primitivas:

1.1. $\int x^4 dx = \frac{x^5}{5} + c$, c constante

1.2. $\int 3x^4 - 2x^3 dx = 3\frac{x^5}{5} - \frac{x^4}{2} + c$, c constante

1.3. $\int \frac{x^4}{3} - 2x^2 + 5 - \frac{3}{x^4} dx = \frac{x^5}{15} - 2\frac{x^3}{3} + 5x + \frac{3}{5x^5} + c$, c constante

1.4. $\int \sqrt[3]{x^4} + 3\sqrt[5]{x} dx = \frac{3x^{\frac{7}{3}}}{7} + \frac{5x^{\frac{6}{5}}}{6} + c$, c constante

1.5. $\int \frac{\sqrt{x}+3\sqrt[3]{x}}{x} dx = 2x^{\frac{1}{2}} + 9x^{\frac{1}{3}} + c$, c constante

1.6. $\int x^3 e^{x^4} dx = \frac{1}{4} e^{x^4} + c$, c constante

1.7. $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx = 2e^{\sqrt{x}} + c$, c constante

1.8. $\int e^{\sin 2x} \cos 2x \, dx = \frac{1}{2} e^{\sin 2x} + c$, c constante

1.9. $\int \frac{e^{\frac{1}{x}}}{x^2} dx = -e^{\frac{1}{x}} + c$, c constante

1.10. $\int \frac{e^x}{1+4e^x} dx = \frac{1}{4} \ln|1 + 4e^x| + c$, c constante

1.11. $\int \frac{\operatorname{sen} x - \cos x}{\operatorname{sen} x + \cos x} dx = -\ln|\operatorname{sen} x + \cos x| + c$, c constante

1.12. $\int \frac{1}{x \ln x} dx = \ln|\ln x| + c$, c constante

1.13. $\int \frac{x^3}{\sqrt{1-x^4}} dx = -\frac{1}{2}\sqrt{1 - x^4} + c$, c constante

1.14. $\int \frac{x}{1+x^2} dx = \frac{1}{2} \operatorname{arctg}(1 + x^2) + c$, c constante

1.15. $\int \frac{3 \operatorname{sen} x}{(1+\cos x)^2} dx = 3(1 + \cos x)^{-1} + c$, c constante

1.16. $\int \frac{x+1}{\sqrt{2x^2+4x+3}} dx = -\frac{1}{2}\sqrt{2x^2 + 4x + 3} + c$, c constante

1.17. $\int \frac{2}{3-5x} dx = -\frac{2}{5} \ln|3 - 5x| + c$, c constante

1.18. $\int 2^{3x} dx = \frac{1}{3 \ln 2} 2^{3x} + c$, c constante

1.19. $\int x^3 \cos x^4 \, dx = \frac{1}{4} \operatorname{sen} x^4 + c$, c constante

1.20. $\int \cos x \, e^{2 \operatorname{sen} x} dx = \frac{1}{2} e^{2 \operatorname{sen} x} + c$, c constante

1.21. $\int \cos(5x) \, dx = \frac{1}{5} \operatorname{sen}(5x) + c$, c constante

1.22. $\int \operatorname{sen}\left(\frac{x}{7}\right) dx = -7 \cos\left(\frac{x}{7}\right) + c$, c constante

1.23. $\int e^x \operatorname{sen}(e^x) \, dx = -\cos(e^x) + c$, c constante

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

1.25. $\int \frac{8x^2}{1+4x^6} dx = \frac{8}{6} \operatorname{arctg}(2x^3) + c$, c constante

1.26. $\int \frac{3}{x\sqrt{1-\ln^2 x}} dx = 3 \operatorname{arcsen}(\ln x) + c$, c constante

1.27. $\int (2 - x)\sqrt{x} dx = \frac{4}{3} x^{\frac{3}{2}} - \frac{2}{5} x^{\frac{5}{2}} + c$, c constante

1.28. $\int \frac{3x+9}{1+x^2} dx = \frac{3}{2} \ln|1 + x^2| + 9 \operatorname{arctg}(x) + c$, c constante

1.29. $\int \frac{e^x + 5e^{2x}}{1+e^{2x}} dx = \operatorname{arctg}(x) + \frac{5}{2} \ln|1 + e^{2x}| + c$, c constante

1.30. $\int \frac{1+2x^3}{2x+x^4} dx = \frac{1}{2} \ln|2x + x^4| + c$, c constante

2. Primitive as seguintes funções por partes:

2.1. $\int x^2 e^x dx = e^x x^2 - 2xe^x + 2e^x$ +c, c constante

2.2. $\int e^x \operatorname{sen} x\, dx = \frac{e^x \operatorname{sen} x - e^x \cos x}{2}$ +c, c constante

2.3. $\int \operatorname{sen}^2 x\, dx = \frac{x - \operatorname{sen} x \cos x}{2}$ +c, c constante

2.4. $\int x \ln x\, dx = \frac{x^2}{2} \ln x - \frac{x^2}{4}$ +c, c constante

2.5. $\int \ln^2 x\, dx = x \ln^2 x - 2x \ln x + 2x$ +c, c constante

2.6. $\int e^{2x} x^3 dx = \frac{1}{2} e^{2x} x^3 - \frac{3}{4} e^{2x} x^2 + \frac{3}{4} e^{2x} x - \frac{3}{8} e^{2x}$ +c, c constante

2.7. $\int \ln(x^2 + 1)\, dx = x \ln(x^2 + 1) - 2x + 2 \operatorname{arctg} x$ +c, c constante

2.8. $\int \frac{1}{x} \ln x\, dx = \frac{1}{2} \ln^2 x$ +c, c constante

2.9. $\int x \operatorname{sen} x\, dx = -x \cos x + \operatorname{sen} x$ +c, c constante

2.10. $\int x\sqrt{x+1} dx = \frac{2}{3} x (x+1)^{\frac{3}{2}} - \frac{4}{15} (x+1)^{\frac{5}{2}}$ +c, c constante

2.11. $\int \ln(1-x)\, dx = (x-1) \ln(1-x) - x$ +c, c constante

3. Primitive as seguintes funções racionais:

3.1. $\int \frac{4x}{x^2 - 5x + 6} dx = 12 \ln|x-3| - 8 \ln|x-2|$ +c, c constante

3.2. $\int \frac{2x-1}{(x-1)(x-2)} dx = 3 \ln|x-2| - \ln|x-1|$ +c, c constante

3.3. $\int \frac{x^3}{x+1} dx = \frac{x^3}{3} - \frac{x^2}{2} + x - \ln|x+1|$ +c, c constante

3.4. $\int \frac{x^3}{x^2+1} dx = \frac{x^2}{2} - \frac{1}{2} \ln|x^2+1|$ +c, c constante

3.5. $\int \frac{8x^2 + x + 1}{x^3 - x} dx = -\ln|x| + 5 \ln|x-1| + 4 \ln|x+1|$ +c, c constante

3.6. $\int \frac{x+1}{2x^2 - 5x + 2} dx = \ln|x-2| - \frac{1}{2} \ln\left|x - \frac{1}{2}\right|$ +c, c constante

3.7. $\int \frac{x^3+1}{x^2 - 2x + 10} dx = \frac{x^2}{2} + 2x - 3 \ln|x^2 - 2x + 10| - \frac{25}{3} \operatorname{arctg}\left(\frac{x-1}{3}\right)$ +c, c constante

3.8. $\int \frac{x^2 - 3x + 1}{x^2 + 2x + 1} dx = x - 5 \ln|x+1| - \frac{5}{x+1}$ +c, c constante

4. Primitive as seguintes potências de funções trigonométricas:

4.1. $\int \operatorname{sen}^2 x\, dx = \frac{1}{2} x + \frac{1}{4} \cos 2x$ +c, c constante

4.2. $\int \cos^2 x\, dx = \frac{1}{2} x + \frac{1}{4} \operatorname{sen} 2x$ +c, c constante

4.3. $\int \operatorname{sen}^3 x\, dx = -\cos x + \frac{\cos^3 x}{3}$ +c, c constante

4.4. $\int \cos^3 x\, dx = \operatorname{sen} x - \frac{\operatorname{sen}^3 x}{3}$ +c, c constante

4.5. $\int \operatorname{sen}^2 x \cos^3 x\, dx = \frac{\operatorname{sen}^3 x}{3} - \frac{\operatorname{sen}^5 x}{5}$ +c, c constante

4.6. $\int \operatorname{sen}^4 x\, dx = \frac{1}{4} x - \frac{1}{4} \operatorname{sen} 2x + \frac{1}{8} x + \frac{1}{32} \operatorname{sen} 4x$ +c, c constante

4.7. $\int \cos^4 x\, dx = \frac{1}{4} x + \frac{1}{4} \operatorname{sen} 2x + \frac{1}{8} x + \frac{1}{32} \operatorname{sen} 4x$ +c, c constante

4.8. $\int \cos^5 x\, dx = \operatorname{sen} x - 2 \frac{\operatorname{sen}^3 x}{3} + \frac{\operatorname{sen}^5 x}{5}$ +c, c constante

4.9. $\int \operatorname{sen}^5 x \cos^5 x\, dx = \frac{\operatorname{sen}^6 x}{6} - 2 \frac{\operatorname{sen}^8 x}{8} + \frac{\operatorname{sen}^{10} x}{10}$ +c, c constante

4.10. $\int \operatorname{sen}^2 x \cos^2 x\, dx = \frac{1}{8} x - \frac{1}{32} \operatorname{sen} 4x$ +c, c constante

4.11. $\int \operatorname{sen}^3 x \cos^4 x\, dx = -\frac{\cos^5 x}{5} + \frac{\cos^7 x}{7}$ +c, c constante

4.12. $\int \operatorname{sen}^7 x \cos^3 x\, dx = \frac{\operatorname{sen}^8 x}{8} - \frac{\operatorname{sen}^{10} x}{10}$ +c, c constante

4.13. $\int \cos^6 x\, dx = \frac{3}{8} x + \frac{1}{16} \operatorname{sen} 4x + \frac{3}{16} \operatorname{sen} 2x - \frac{1}{16} \frac{\operatorname{sen}^3 2x}{3}$ +c, c constante