

Calcula las siguientes integrales:

1. $\int (4x^5 - 2x^2) dx$

2. $\int (3x^3 - 5x^2 - 2x + 4) dx$

3. $\int (5x^6 - 3x^2) dx$

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

5. $\int (4x^5 - \text{sen}x + e^x) dx$

6. $\int \frac{3x^2}{x^3 + 2} dx$

7. $\int (x^5 - 3^x \cdot \ln 3 - \cos x) dx$

8. $\int (3x^6 - \frac{2}{x} - 2\text{sen}x + 5\cos x) dx$

9. $\int (5^x - 2\text{sen}2x + \cos 3x) dx$

10. $\int (3^x - x \cdot e^{x^2} + x^3 \cdot \cos 3x^4) dx$

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

12. $\int x^2 \sqrt{x} dx$

13. $\int \sqrt[3]{x^2} dx$

14. $\int \frac{dx}{\sqrt[5]{x}}$

15. $\int \frac{3x^4}{5} dx$

16. $\int \sqrt{5x} dx$

17. $\int \frac{dx}{\sqrt[5]{8x^2}}$

18. $\int 3x^{5/2} dx$

19. $\int (3 - 4x) dx$

20. $\int (x^5 - 7 + \frac{4}{x^2}) dx$

21. $\int \frac{x^7 - 7x^2 + 4}{x} dx$

22. $\int (x + 4)^3 dx$

23. $\int (3x + 4)^3 dx$

24. $\int x^2 \cdot (x^3 - 2)^5 dx$

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

26. $\int (\sqrt{x} - \sqrt{a})^2 dx$

27. $\int \sqrt{x - a} dx$

28. $\int (\sqrt{x} + 1) \cdot (x - \sqrt{x} + 1) dx$

29. $\int (2x + 5) \cdot \sqrt{x^2 + 5x + 7} dx$

30. $\int x \cdot \sqrt[3]{x^2 + 5} dx$

31. $\int \frac{x}{\sqrt{1 - x^2}} dx$

32. $\int \frac{x}{x^2 + 1} dx$

33. $\int \frac{x}{\sqrt{x^2 + 1}} dx$

34. $\int \frac{x}{x^2 - 5} dx$

35. $\int x \cdot 7^{x^2} dx$

36. $\int \frac{e^x}{e^x - 1} dx$

37. $\int (\text{sen}(2x + 5) - x^4 \cdot \cos 3x^4) dx$

38. $\int [\text{sen}^2 x \cdot \cos x - \cos(x + 1)^2 \cdot (x + 1)] dx$

39. $\int \cos \frac{x}{\sqrt{2}} dx$

40. $\int \text{tg}^3 \frac{x}{3} \cdot \sec^2 \frac{x}{3} dx$

41. $\int \frac{\sqrt{\text{tg} x}}{\cos^2 x} dx$

42. $\int x \cdot \text{sen}(1 - x^2) dx$

43. $\int \frac{dx}{\text{tg}(x/5)}$

44. $\int 2x \cdot \text{sen} x^2 dx$

45. $\int (2x + 1) \cdot e^{x^2 + x} dx$

46. $\int (x + 1) \cdot e^{-x^2 + 2x} dx$

47. $\int \cos(2x + 1) dx$

48. $\int \frac{\ln x}{x} dx$

49. $\int \frac{\ln^3 2x}{x} dx$

50. $\int \text{sen}(2x + \pi) dx$

51. $\int \text{tg}^2 x dx$

52. $\int \text{tg}^3 x dx$

53. $\int \frac{\ln(1 + x)}{1 + x} dx$

54. $\int \text{sen}^4 x \cdot \cos x dx$

55. $\int \frac{1}{x^2} \cdot \cos \frac{1}{x} dx$
56. $\int \frac{1}{5x} \cdot (\ln x)^7 dx$
57. $\int x \cdot \sqrt{1-x^2} dx$
58. $\int \frac{e^{2x}}{\sqrt{1-e^{4x}}} dx$
59. $\int e^{\operatorname{sen}5x} \cdot \cos 5x dx$
60. $\int \frac{\operatorname{sen} x}{1+\cos^2(x/2)} dx$
61. $\int \left(3x + 4x\sqrt{2x} + \frac{1}{\sqrt{2x}} \right) dx$
62. $\int \left(e^x + 3^x - \operatorname{sen}2x + \frac{4}{x} \right) dx$
63. $\int \frac{5x + \sqrt{3x}}{x^2} dx$
64. $\int \frac{x^3 + -2\sqrt[3]{x} + 2x\sqrt{x} - 1}{5x} dx$
65. $\int \frac{4^x + 6^x}{2^{x-1}} dx$
66. $\int \frac{x^2 + 2}{(x+1)^2 - 2x} dx$
67. $\int \cot g^2 x dx$
68. $\int \sqrt{x\sqrt{x^2}\sqrt{x^3}} dx$
69. $\int x \cdot (3x^2 - 5)^5 dx$
70. $\int \frac{3x+1}{x^2+4} dx$
71. $\int \frac{e^{2x}}{\sqrt{e^{2x}+3}} dx$
72. $\int \frac{3x^2 - 4x + 1}{2x^3 - 4x^2 + 2x + 5} dx$
73. $\int \operatorname{sen}3x \cdot \cos 3x dx$
74. $\int \frac{2x}{\cos^2 5x^2} dx$
75. $\int \frac{dx}{\sqrt{9-x^2}}$
76. $\int \frac{x}{\sqrt{5-x^2}} dx$
77. $\int \frac{dx}{\sqrt{x}(1-\sqrt{x})}$
78. $\int \frac{1}{x^2+7} dx$
79. $\int \frac{dx}{3x^2+5}$
80. $\int \frac{x^2}{1+x^6} dx$
81. $\int \frac{x}{x^4+3} dx$
82. $\int \left(x + \frac{1}{\sqrt{x}} \right) \cdot \sqrt[3]{x} dx$
83. $\int \frac{\ln^5 6x}{3x} dx$
84. $\int \frac{3}{x \cdot \ln 2x} dx$
85. $\int \operatorname{sen}^2 5x \cdot \cos 5x dx$
86. $\int \frac{\sqrt{7+2\operatorname{tg}x}}{\cos^2 x} dx$
87. $\int \frac{1-\operatorname{sen}^2 x}{\operatorname{sen}x \cdot \cos x} dx$
88. $\int \operatorname{tg}(2x+1) dx$
89. $\int \frac{x}{\sqrt{x^2+1}} dx$
90. $\int x \cdot \sqrt{x^2+1} dx$
91. $\int \frac{x}{x^4+9} dx$
92. $\int \frac{\operatorname{sen}x + \cos x}{\cos^3 x} dx$
93. $\int \frac{\sqrt[3]{x}}{x \cdot \cos^2 \sqrt[3]{x}} dx$
94. $\int \frac{2e^x}{\sqrt{1-e^{2x}}} dx$
95. $\int \frac{5x+2}{1+2x^2} dx$
96. $\int \frac{1+\operatorname{tg}^2 x}{\sqrt{1+2\operatorname{tg}x}} dx$
97. $\int \frac{e^{\sqrt{2x}}}{\sqrt{x}} dx$
98. $\int \frac{2x^3}{1+x^8} dx$
99. $\int \frac{2^x}{1+4^x} dx$
100. $\int \frac{2e^{-x}}{2+e^{-x}} dx$

SOLUCIONES

Calcula las siguientes integrales:

$$1. \int (4x^5 - 2x^2) dx = \frac{4x^6}{6} - \frac{2x^3}{3} + C = \frac{2x^6}{3} - \frac{2x^3}{3} + C$$

$$2. \int (3x^3 - 5x^2 - 2x + 4) dx = \frac{3x^4}{4} - \frac{5x^3}{3} - \frac{2x^2}{2} + 4x + C = \frac{3x^4}{4} - \frac{5x^3}{3} - x^2 + 4x + C$$

$$3. \int (5x^6 - 3x^2) dx = \frac{5x^7}{7} - \frac{3x^3}{3} + C = \frac{5x^7}{7} - x^3 + C$$

$$4. \int (x^2 - x + \frac{1}{x} - \frac{2}{x^3}) dx = \int (x^2 - x + \frac{1}{x} - 2x^{-3}) dx = \frac{x^3}{3} - \frac{x^2}{2} + \ln|x| - \frac{2x^{-2}}{-2} + C = \frac{x^3}{3} - \frac{x^2}{2} + \ln|x| + \frac{1}{x^2} + C$$

$$5. \int (4x^5 - \operatorname{sen} x + e^x) dx = \frac{4x^6}{6} + \cos x + e^x + C = \frac{2x^6}{3} + \cos x + e^x + C$$

$$6. \int \frac{3x^2}{x^3 + 2} dx = \ln|x^3 + 2| + C$$

$$7. \int (x^5 - 3^x \cdot \ln 3 - \cos x) dx = \frac{x^6}{6} - 3^x - \operatorname{sen} x + C$$

$$8. \int (3x^6 - \frac{2}{x} - 2\operatorname{sen} x + 5 \cos x) dx = \int (3x^6 - 2 \cdot \frac{1}{x} - 2\operatorname{sen} x + 5 \cos x) dx = \frac{3x^7}{7} - 2 \ln|x| + 2 \cos x + 5 \operatorname{sen} x + C$$

$$9. \int (5^x - 2\operatorname{sen} 2x + \cos 3x) dx = \int 5^x dx - \int 2\operatorname{sen} 2x dx + \frac{1}{3} \int 3 \cdot \cos 3x dx = \frac{5^x}{\ln 5} + \cos 2x + \frac{1}{3} \operatorname{sen} 3x + C$$

$$10. \int (3^x - x \cdot e^{x^2} + x^3 \cdot \cos 3x^4) dx = \int 3^x dx - \frac{1}{2} \cdot \int 2x \cdot e^{x^2} dx + \frac{1}{12} \cdot \int 12x^3 \cdot \cos 3x^4 dx = \frac{3^x}{3} - \frac{1}{2} e^{x^2} + \frac{1}{12} \operatorname{sen} 3x^4 + C$$

$$11. \int (\frac{1}{x^4} - \sqrt{x} + \sec^2 x) dx = \int (x^{-4} - x^{\frac{1}{2}} + \sec^2 x) dx = \frac{x^{-3}}{-3} - \frac{x^{\frac{3}{2}}}{\frac{3}{2}} + \operatorname{tg} x + C = -\frac{1}{3x^3} - \frac{2}{3} \sqrt{x^3} + \operatorname{tg} x + C$$

$$12. \int x^2 \sqrt{x} dx = \int x^2 \cdot x^{\frac{1}{2}} dx = \int x^{\frac{5}{2}} dx = \frac{x^{\frac{7}{2}}}{\frac{7}{2}} + C = \frac{2}{7} \sqrt{x^7} + C$$

$$13. \int \sqrt[3]{x^2} dx = \int x^{\frac{2}{3}} dx = \frac{x^{\frac{5}{3}}}{\frac{5}{3}} + C = \frac{3}{5} \sqrt[3]{x^5} + C$$

$$14. \int \frac{dx}{\sqrt[5]{x}} = \int \frac{1}{\sqrt[5]{x}} dx = \int \frac{1}{x^{\frac{1}{5}}} dx = \int x^{-\frac{1}{5}} dx = \frac{x^{\frac{4}{5}}}{\frac{4}{5}} + C = \frac{5}{4} \sqrt[5]{x^4} + C$$

$$15. \int \frac{3x^4}{5} dx = \frac{3}{5} \int x^4 dx = \frac{3}{5} \cdot \frac{x^5}{5} + C = \frac{3x^5}{25} + C$$

$$16. \int \sqrt{5x} dx = \int \sqrt{5x^{\frac{1}{2}}} dx = \sqrt{5} \cdot \frac{x^{\frac{3}{2}}}{\frac{3}{2}} + C = \sqrt{5} \cdot \frac{2}{3} \cdot \sqrt{x^3} + C = \frac{2}{3} \sqrt{5x^3} + C$$

$$17. \int \frac{dx}{\sqrt[5]{8x^2}} = \int \frac{1}{\sqrt[5]{8x^{\frac{2}{5}}}} dx = \frac{1}{\sqrt[5]{8}} \int \frac{1}{x^{\frac{2}{5}}} dx = \frac{1}{\sqrt[5]{8}} \int x^{-\frac{2}{5}} dx = \frac{1}{\sqrt[5]{8}} \cdot \frac{x^{\frac{3}{5}}}{\frac{3}{5}} + C = \frac{1}{\sqrt[5]{8}} \cdot \frac{5}{3} \cdot \sqrt[5]{x^3} + C = \frac{5}{3} \sqrt[5]{\frac{x^3}{8}} + C$$

$$18. \int 3x^{5/2} dx = 3 \cdot \frac{x^{7/2}}{7/2} + C = 3 \cdot \frac{2}{7} \sqrt{x^7} + C = \frac{6}{7} \sqrt{x^7} + C$$

$$19. \int (3-4x) dx = 3x - \frac{4x^2}{2} + C = 3x - 2x^2 + C$$

$$20. \int (x^5 - 7 + \frac{4}{x^2}) dx = \int (x^5 - 7 + 4x^{-2}) dx = \frac{x^6}{6} - 7x + 4 \frac{x^{-1}}{-1} + C = \frac{x^6}{6} - 7x + 4 \left(-\frac{1}{x} \right) + C = \frac{x^6}{6} - 7x - \frac{4}{x} + C$$

$$21. \int \frac{x^7 - 7x^2 + 4}{x} dx = \int \left(x^6 - 7x + 4 \cdot \frac{1}{x} \right) dx = \frac{x^7}{7} - \frac{7x^2}{2} + 4 \ln|x| + C$$

$$22. \int (x+4)^3 dx = \frac{(x+4)^4}{4} + C$$

$$23. \int (3x+4)^3 dx = \frac{1}{3} \cdot \int 3 \cdot (3x+4)^3 dx = \frac{1}{3} \cdot \frac{(3x+4)^4}{4} + C = \frac{(3x+4)^4}{12} + C$$

$$24. \int x^2 \cdot (x^3 - 2)^5 dx = \frac{1}{3} \cdot \int 3x^2 \cdot (x^3 - 2)^5 dx = \frac{1}{3} \cdot \frac{(x^3 - 2)^6}{6} + C = \frac{(x^3 - 2)^6}{18} + C$$

$$25. \int \frac{(x^2 - 1)^2}{\sqrt{x}} dx = \int \frac{x^4 - 2x^2 + 1}{x^{\frac{1}{2}}} dx = \int \left(x^{\frac{7}{2}} - 2x^{\frac{3}{2}} + x^{\frac{1}{2}} \right) dx = \frac{x^{\frac{9}{2}}}{9/2} - 2 \frac{x^{\frac{5}{2}}}{5/2} + \frac{x^{\frac{3}{2}}}{1/2} + C = \frac{2}{9} \sqrt{x^9} - \frac{4}{5} \sqrt{x^5} + 2\sqrt{x} + C$$

$$26. \int (\sqrt{x} - \sqrt{a})^2 dx = \int (x - 2\sqrt{a}\sqrt{x} + a) dx = \int \left(x - 2\sqrt{a}x^{\frac{1}{2}} + a \right) dx = \frac{x^2}{2} - 2\sqrt{a} \frac{x^{\frac{3}{2}}}{\frac{3}{2}} + ax + C =$$

$$= \frac{x^2}{2} - \frac{4}{3} \sqrt{a} \sqrt{x^3} + ax + C = \frac{x^2}{2} - \frac{4}{3} \sqrt{ax^3} + ax + C$$

$$27. \int \sqrt{x-a} dx = \int (x-a)^{\frac{1}{2}} dx = \frac{(x-a)^{\frac{3}{2}}}{\frac{3}{2}} + C = \frac{2}{3} \sqrt{(x-a)^3} + C$$

$$28. \int (\sqrt{x} + 1) \cdot (x - \sqrt{x} + 1) dx = \int (x\sqrt{x} - x + \sqrt{x} + x - \sqrt{x} + 1) dx = \int \left(x^{\frac{3}{2}} + 1 \right) dx = \frac{x^{\frac{5}{2}}}{5/2} + x + C = \frac{2}{5} \sqrt{x^5} + x + C$$

$$29. \int (2x + 5) \cdot \sqrt{x^2 + 5x + 7} dx = \int (2x + 5) \cdot (x^2 + 5x + 7)^{\frac{1}{2}} dx = \frac{(x^2 + 5x + 7)^{\frac{3}{2}}}{3/2} + C = \frac{2}{3} \sqrt{(x^2 + 5x + 7)^3} + C$$

$$30. \int x \cdot \sqrt[3]{x^2 + 5} dx = \int x \cdot (x^2 + 5)^{\frac{1}{3}} dx = \frac{1}{2} \int 2x \cdot (x^2 + 5)^{\frac{1}{3}} dx = \frac{1}{2} \cdot \frac{(x^2 + 5)^{\frac{4}{3}}}{4/3} + C = \frac{1}{2} \cdot \frac{3}{4} \sqrt[3]{(x^2 + 5)^4} + C = \frac{3}{8} \sqrt[3]{(x^2 + 5)^4} + C$$

$$31. \int \frac{x}{\sqrt{1-x^2}} dx = \int x \cdot (1-x^2)^{-\frac{1}{2}} dx = -\frac{1}{2} \int -2x \cdot (1-x^2)^{-\frac{1}{2}} dx = -\frac{1}{2} \cdot \frac{(1-x^2)^{\frac{1}{2}}}{1/2} + C = -\sqrt{1-x^2} + C$$

$$32. \int \frac{x}{x^2+1} dx = \frac{1}{2} \cdot \int \frac{2x}{x^2+1} dx = \frac{1}{2} \ln|x^2+1| + C$$

$$33. \int \frac{x}{\sqrt{x^2+1}} dx = \int x \cdot (x^2+1)^{-\frac{1}{2}} dx = \frac{1}{2} \cdot \int 2x \cdot (x^2+1)^{-\frac{1}{2}} dx = \frac{1}{2} \cdot \frac{(x^2+1)^{\frac{1}{2}}}{1/2} + C = \sqrt{x^2+1} + C$$

$$34. \int \frac{x}{x^2-5} dx = \frac{1}{2} \cdot \int \frac{2x}{x^2-5} dx = \frac{1}{2} \ln|x^2-5| + C$$

$$35. \int x \cdot 7^{x^2} dx = \frac{1}{2} \cdot \int 2x \cdot 7^{x^2} dx = \frac{1}{2} \cdot \frac{7^{x^2}}{\ln 7} + C = \frac{7^{x^2}}{2 \ln 7} + C$$

$$36. \int \frac{e^x}{e^x-1} dx = \ln|e^x-1| + C$$

$$37. \int (\sin(2x+5) - x^3 \cdot \cos 3x^4) dx = \int \sin(2x+5) dx - \int x^3 \cdot \cos 3x^4 dx = \frac{1}{2} \int 2 \sin(2x+5) dx - \frac{1}{12} \int 12x^3 \cdot \cos 3x^4 dx = -\frac{1}{2} \cos(2x+5) - \frac{1}{12} \sin 3x^4 + C$$

$$38. \int [\sin^2 x \cdot \cos x - \cos(x+1)^2 \cdot (x+1)] dx = \int \sin^2 x \cdot \cos x dx - \int \cos(x+1)^2 \cdot (x+1) dx = \int \sin^2 x \cdot \cos x dx - \frac{1}{2} \int \cos(x+1)^2 \cdot 2(x+1) dx = \frac{\sin^3 x}{3} - \frac{1}{2} \sin(x+1)^2 + C$$

$$39. \int \cos \frac{x}{\sqrt{2}} dx = \sqrt{2} \cdot \int \frac{1}{\sqrt{2}} \cdot \cos \frac{x}{\sqrt{2}} dx = \sqrt{2} \cdot \sin \frac{x}{\sqrt{2}} + C$$

$$40. \int \operatorname{tg}^3 \frac{x}{3} \cdot \sec^2 \frac{x}{3} dx = 3 \cdot \int \operatorname{tg}^3 \frac{x}{3} \cdot \sec^2 \frac{x}{3} \cdot \frac{1}{3} dx = 3 \cdot \frac{\operatorname{tg}^4 \frac{x}{3}}{4} + C = \frac{3}{4} \cdot \operatorname{tg}^4 \frac{x}{3} + C$$

$$41. \int \frac{\sqrt{\operatorname{tg} x}}{\cos^2 x} dx = \int \frac{1}{\cos^2 x} \cdot (\operatorname{tg} x)^{\frac{1}{2}} dx = \frac{(\operatorname{tg} x)^{\frac{3}{2}}}{3/2} + C = \frac{2}{3} \sqrt{\operatorname{tg}^3 x} + C$$

$$42. \int x \cdot \operatorname{sen}(1-x^2) dx = -\frac{1}{2} \cdot \int -2x \cdot \operatorname{sen}(1-x^2) dx = -\frac{1}{2} \cdot (-\cos(1-x^2)) + C = \frac{1}{2} \cos(1-x^2) + C$$

$$43. \int \frac{dx}{\operatorname{tg}(x/5)} = \int \operatorname{cotg}(x/5) dx = \int \frac{\cos(x/5)}{\operatorname{sen}(x/5)} dx = 5 \cdot \int \frac{\cos(x/5)}{\operatorname{sen}(x/5)} dx = 5 \ln \left| \operatorname{sen} \left(\frac{x}{5} \right) \right| + C$$

$$44. \int 2x \cdot \operatorname{sen} x^2 dx = -\cos x^2 + C$$

$$45. \int (2x+1) \cdot e^{x^2+x} dx = e^{x^2+x} + C$$

$$46. \int (x+1) \cdot e^{x^2+2x} dx = \frac{1}{2} \cdot \int 2(x+1) \cdot e^{x^2+2x} dx = \frac{1}{2} e^{x^2+2x} + C$$

$$47. \int \cos(2x+1) dx = \frac{1}{2} \cdot \int 2 \cos(2x+1) dx = \frac{1}{2} \operatorname{sen}(2x+1) + C$$

$$48. \int \frac{\ln x}{x} dx = \int \frac{1}{x} \cdot (\ln x)^1 dx = \frac{(\ln x)^2}{2} + C$$

$$49. \int \frac{\ln^3 2x}{x} dx = \int \frac{1}{x} \cdot \ln^3 2x dx = \frac{\ln^4 2x}{4} + C$$

$$50. \int \operatorname{sen}(2x+\pi) dx = \frac{1}{2} \cdot \int 2 \operatorname{sen}(2x+\pi) dx = \frac{1}{2} \cdot (-\cos(2x+\pi)) + C = -\frac{1}{2} \cos(2x+\pi) + C$$

$$51. \int \operatorname{tg}^2 x dx = \int (\sec^2 x - 1) dx = \operatorname{tg} x - x + C$$

$$\begin{aligned} 52. \int \operatorname{tg}^3 x dx &= \int \operatorname{tg}^2 x \cdot \operatorname{tg} x dx = \int (\sec^2 x - 1) \cdot \operatorname{tg} x dx = \int (\sec^2 x \cdot \operatorname{tg} x - \operatorname{tg} x) dx = \\ &= \int \sec^2 x \cdot \operatorname{tg} x dx - \int \operatorname{tg} x dx = \int \sec^2 x \cdot \operatorname{tg} x dx - \int \frac{\operatorname{sen} x}{\cos x} dx = \int \sec^2 x \cdot \operatorname{tg} x dx + \int \frac{-\operatorname{sen} x}{\cos x} dx = \\ &= \frac{\operatorname{tg}^2 x}{2} + \ln |\cos x| + C \end{aligned}$$

$$53. \int \frac{\ln(1+x)}{1+x} dx = \int \frac{1}{1+x} \cdot \ln(1+x) dx = \frac{[\ln(1+x)]^2}{2} + C$$

$$54. \int \operatorname{sen}^4 x \cdot \cos x \, dx = \frac{\operatorname{sen}^5 x}{5} + C$$

$$55. \int \frac{1}{x^2} \cdot \cos \frac{1}{x} \, dx = -\int -\frac{1}{x^2} \cdot \cos \frac{1}{x} \, dx = -\operatorname{sen} \frac{1}{x} + C$$

$$56. \int \frac{1}{5x} \cdot (\ln x)^7 \, dx = \frac{1}{5} \cdot \int \frac{1}{x} \cdot (\ln x)^7 \, dx = \frac{1}{5} \cdot \frac{(\ln x)^8}{8} + C = \frac{(\ln x)^8}{40} + C$$

$$57. \int x \cdot \sqrt{1-x^2} \, dx = \int x \cdot (1-x^2)^{\frac{1}{2}} \, dx = -\frac{1}{2} \int -2x \cdot (1-x^2)^{\frac{1}{2}} \, dx = -\frac{1}{2} \cdot \frac{(1-x^2)^{\frac{3}{2}}}{\frac{3}{2}} + C = -\frac{1}{2} \cdot \frac{2}{3} \sqrt{(1-x^2)^3} + C = -\frac{1}{3} \sqrt{(1-x^2)^3} + C$$

$$58. \int \frac{e^{2x}}{\sqrt{1-e^{4x}}} \, dx = \int \frac{e^{2x}}{\sqrt{1-(e^{2x})^2}} \, dx = \frac{1}{2} \cdot \int \frac{2e^{2x}}{\sqrt{1-(e^{2x})^2}} \, dx = \frac{1}{2} \operatorname{arcsen} e^{2x} + C$$

$$59. \int e^{\operatorname{sen} 5x} \cdot \cos 5x \, dx = \frac{1}{5} \int e^{\operatorname{sen} 5x} \cdot \cos 5x \cdot 5 \, dx = \frac{1}{5} e^{\operatorname{sen} 5x} + C$$

$$60. \int \frac{\operatorname{sen} x}{1+\cos^2(x/2)} \, dx = \int \frac{\operatorname{sen} x}{1+\frac{1+\cos x}{2}} \, dx = \int \frac{\operatorname{sen} x}{\frac{2+1+\cos x}{2}} \, dx = \int \frac{\operatorname{sen} x}{\frac{3+\cos x}{2}} \, dx = \int \frac{2\operatorname{sen} x}{3+\cos x} \, dx = -2 \int \frac{-\operatorname{sen} x}{3+\cos x} \, dx = -2 \ln|3+\cos x| + C$$

$$61. \int \left(3x + 4x\sqrt{2x} + \frac{1}{\sqrt{2x}} \right) dx = \int \left(3x + 4\sqrt{2}x^{\frac{3}{2}} + \frac{1}{\sqrt{2}}x^{-\frac{1}{2}} \right) dx = \frac{3x^2}{2} + 4\sqrt{2} \cdot \frac{x^{\frac{5}{2}}}{\frac{5}{2}} + \frac{\sqrt{2}}{2} \cdot \frac{x^{\frac{1}{2}}}{\frac{1}{2}} + C = \frac{3x^2}{2} + 4\sqrt{2} \cdot \frac{2}{5} \sqrt{x^5} + \frac{\sqrt{2}}{2} \cdot 2\sqrt{x} + C = \frac{3x^2}{2} + \frac{8}{5} \sqrt{2x^5} + \sqrt{2x} + C$$

$$62. \int \left(e^x + 3^x - \operatorname{sen} 2x + \frac{4}{x} \right) dx = \int e^x \, dx + \int 3^x \, dx - \frac{1}{2} \int 2\operatorname{sen} 2x \, dx + 4 \int \frac{1}{x} \, dx = e^x + \frac{3^x}{\ln 3} + \frac{1}{2} \cos 2x + 4 \ln|x| + C$$

$$63. \int \frac{5x + \sqrt{3x}}{x^2} \, dx = \int \left(\frac{5x}{x^2} + \frac{\sqrt{3x}}{x^2} \right) dx = \int \left(\frac{5}{x} + \frac{\sqrt{3x^{\frac{1}{2}}}}{x^2} \right) dx = 5 \int \frac{1}{x} \, dx + \sqrt{3} \int x^{-\frac{3}{2}} \, dx = 5 \ln|x| + \sqrt{3} \cdot \frac{x^{-\frac{1}{2}}}{-\frac{1}{2}} + C = 5 \ln|x| - 2\sqrt{3} \cdot \frac{1}{x^{\frac{1}{2}}} + C = 5 \ln|x| - 2\sqrt{3} \cdot \frac{1}{\sqrt{x}} + C = 5 \ln|x| - 2\sqrt{3} \cdot \frac{\sqrt{x}}{x} + C = 5 \ln|x| - \frac{2\sqrt{3x}}{x} + C$$

$$64. \int \frac{x^3 - 2\sqrt[3]{x} + 2x\sqrt{x} - 1}{5x} \, dx = \frac{1}{5} \int \frac{x^3 - 2x^{\frac{1}{3}} + 2x^{\frac{3}{2}} - 1}{x} \, dx = \frac{1}{5} \int \left(x^2 - 2x^{-\frac{2}{3}} + 2x^{\frac{1}{2}} - \frac{1}{x} \right) dx =$$

$$= \frac{1}{5} \left(\frac{x^3}{3} - 2 \frac{x^{\frac{1}{3}}}{\frac{1}{3}} + 2 \frac{x^{\frac{3}{2}}}{\frac{3}{2}} - \ln|x| \right) + C = \frac{x^3}{15} - \frac{1}{5} \cdot 2 \cdot 3 \cdot \sqrt[3]{x} + \frac{1}{5} \cdot 2 \cdot \frac{2}{3} \cdot \sqrt{x^3} - \frac{1}{5} \ln|x| + C =$$

$$= \frac{x^3}{15} - \frac{6}{5} \sqrt[3]{x} + \frac{4}{15} \cdot \sqrt{x^3} - \frac{1}{5} \ln|x| + C$$

$$65. \int \frac{4^x + 6^x}{2^{x-1}} dx = \int \frac{4^x + 6^x}{2^x \cdot 2^{-1}} dx = \frac{1}{2^{-1}} \int \frac{4^x + 6^x}{2^x} dx = 2 \int \left(\frac{4^x}{2^x} + \frac{6^x}{2^x} \right) dx = 2 \int (2^x + 3^x) dx = 2 \left(\frac{2^x}{\ln 2} + \frac{3^x}{\ln 3} \right) + C$$

$$66. \int \frac{x^2 + 2}{(x+1)^2 - 2x} dx = \int \frac{x^2 + 2}{x^2 + 2x + 1 - 2x} dx = \int \frac{x^2 + 2}{x^2 + 1} dx = \int \frac{x^2 + 2}{x^2 + 1} dx = \int (1 - \frac{1}{x^2 + 1}) dx = x - \arctg x + C$$

$$(x^2 + 2) : (x^2 + 1) = 1 \text{ Resto} = -1 \Rightarrow \frac{x^2 + 2}{x^2 + 1} = 1 - \frac{1}{x^2 + 1}$$

$$67. \int \cotg^2 x dx = \int (\operatorname{cosec}^2 x - 1) dx = -\cotg x - x + C$$

$$68. \int \sqrt{x} \sqrt{x^2} \sqrt{x^3} dx = \int \sqrt{x} \sqrt{\sqrt{x^4} \cdot x^3} dx = \int \sqrt{x} \sqrt[4]{x^7} dx = \int \sqrt[4]{x^4 \cdot x^7} dx = \int \sqrt[8]{x^{11}} dx = \int x^{\frac{11}{8}} dx = \frac{x^{\frac{19}{8}}}{\frac{19}{8}} + C =$$

$$= \frac{8}{19} \sqrt[8]{x^{19}} + C$$

$$69. \int x \cdot (3x^2 - 5)^5 dx = \frac{1}{6} \int 6x \cdot (3x^2 - 5)^5 dx = \frac{1}{6} \cdot \frac{(3x^2 - 5)^6}{6} + C = \frac{(3x^2 - 5)^6}{36} + C$$

$$70. \int \frac{3x+1}{x^2+4} dx = \int \frac{3x}{x^2+4} dx + \int \frac{1}{x^2+4} dx = 3 \int \frac{x}{x^2+4} dx + \int \frac{1}{x^2+4} dx = 3 \cdot \frac{1}{2} \int \frac{2x}{x^2+4} dx + \int \frac{1}{x^2+4} dx =$$

$$= \frac{3}{2} \ln|x^2+4| + \frac{1}{2} \arctg \left(\frac{x}{2} \right) + C$$

$$(*) \int \frac{1}{a^2+x^2} dx = \frac{1}{a} \arctg \left(\frac{x}{a} \right) + C$$

$$71. \int \frac{e^{2x}}{\sqrt{e^{2x}+3}} dx = \int \frac{e^{2x}}{(e^{2x}+3)^{\frac{1}{2}}} dx = \int e^{2x} (e^{2x}+3)^{-\frac{1}{2}} dx = \frac{1}{2} \cdot \int 2e^{2x} (e^{2x}+3)^{-\frac{1}{2}} dx = \frac{1}{2} \cdot \frac{(e^{2x}+3)^{\frac{1}{2}}}{\frac{1}{2}} + C =$$

$$= \frac{1}{2} \cdot 2 \cdot \sqrt{e^{2x}+3} + C = \sqrt{e^{2x}+3} + C$$

$$72. \int \frac{3x^2 - 4x + 1}{2x^3 - 4x^2 + 2x + 5} dx = \frac{1}{2} \cdot \int \frac{2 \cdot (3x^2 - 4x + 1)}{2x^3 - 4x^2 + 2x + 5} dx = \frac{1}{2} \cdot \int \frac{6x^2 - 8x + 2}{2x^3 - 4x^2 + 2x + 5} dx = \frac{1}{2} \ln|2x^3 - 4x^2 + 2x + 5| + C$$

$$73. \int \operatorname{sen} 3x \cdot \cos 3x dx = \frac{1}{3} \int (\operatorname{sen} 3x)^1 \cdot \cos 3x \cdot 3 dx = \frac{1}{3} \cdot \frac{\operatorname{sen}^2 3x}{2} + C = \frac{\operatorname{sen}^2 3x}{6} + C$$

$$74. \int \frac{2x}{\cos^2 5x^2} dx = \int 2x \cdot \frac{1}{\cos^2 5x^2} dx = 2 \int x \cdot \frac{1}{\cos^2 5x^2} dx = 2 \cdot \frac{1}{10} \int 10x \cdot \frac{1}{\cos^2 5x^2} dx = \frac{1}{5} \int 10x \cdot \sec^2 5x^2 dx = \frac{1}{5} \operatorname{tg} 5x^2 + C$$

$$75. \int \frac{dx}{\sqrt{9-x^2}} = \operatorname{arcsen} \left(\frac{x}{3} \right) + C$$

$$(*) \int \frac{1}{\sqrt{a^2 - f(x)^2}} \cdot f'(x) dx = \operatorname{arcsen} \left(\frac{f(x)}{a} \right) + C$$

$$76. \int \frac{x}{\sqrt{5-x^2}} dx = \int x \cdot (5-x^2)^{-\frac{1}{2}} dx = -\frac{1}{2} \int -2x \cdot (5-x^2)^{-\frac{1}{2}} dx = -\frac{1}{2} \cdot \frac{(5-x^2)^{\frac{1}{2}}}{1/2} + C = -\sqrt{5-x^2} + C$$

$$77. \int \frac{dx}{\sqrt{x(1-\sqrt{x})}} = \int \frac{2t dt}{t(1-t)} = -2 \int \frac{-1}{(1-t)} dt = -2 \ln|1-t| + C = -2 \ln|1-\sqrt{x}| + C$$

$$x = t^2 \Rightarrow \begin{cases} \sqrt{x} = t \\ 1 - \sqrt{x} = 1 - t \\ dx = 2t dt \end{cases}$$

$$78. \int \frac{1}{x^2+7} dx = \frac{1}{\sqrt{7}} \operatorname{arctg} \left(\frac{x}{\sqrt{7}} \right) + C$$

$$(*) \int \frac{1}{a^2+x^2} dx = \frac{1}{a} \operatorname{arctg} \left(\frac{x}{a} \right) + C$$

$$79. \int \frac{dx}{3x^2+5} = \int \frac{1}{3x^2+5} dx = \int \frac{\frac{1}{5}}{\frac{3x^2}{5} + \frac{5}{5}} dx = \frac{1}{5} \int \frac{1}{\left(\frac{\sqrt{3}}{\sqrt{5}}x\right)^2 + 1} dx = \frac{1}{5} \int \frac{1}{\left(\frac{\sqrt{15}}{5}x\right)^2 + 1} dx = \frac{1}{5} \cdot \frac{5}{\sqrt{15}} \int \frac{\frac{\sqrt{15}}{5}}{\left(\frac{\sqrt{15}}{5}x\right)^2 + 1} dx = \frac{1}{\sqrt{15}} \operatorname{arctg} \left(\frac{\sqrt{15}}{5}x \right) + C = \frac{\sqrt{15}}{15} \operatorname{arctg} \left(\frac{\sqrt{15}}{5}x \right) + C = \frac{\sqrt{15}}{15} \operatorname{arctg} \left(\frac{\sqrt{15}}{5}x \right) + C$$

$$80. \int \frac{x^2}{1+x^6} dx = \int \frac{x^2}{1+(x^3)^2} dx = \frac{1}{3} \int \frac{3x^2}{1+(x^3)^2} dx = \frac{1}{3} \operatorname{arctg}(x^3) + C$$

$$81. \int \frac{x}{x^4+3} dx = \int \frac{x}{(x^2)^2+3} dx = \frac{1}{2} \int \frac{2x}{(x^2)^2+3} dx = \frac{1}{2} \int \frac{1}{3+(x^2)^2} \cdot 2x dx = \frac{1}{2} \cdot \frac{1}{\sqrt{3}} \operatorname{arctg} \left(\frac{x^2}{\sqrt{3}} \right) + C = \frac{1}{2\sqrt{3}} \operatorname{arctg} \left(\frac{x^2}{\sqrt{3}} \right) + C$$

$$(*) \int \frac{1}{a^2 + f(x)^2} \cdot f'(x) dx = \frac{1}{a} \operatorname{arctg} \left(\frac{f(x)}{a} \right) + C$$

$$82. \int \left(x + \frac{1}{\sqrt{x}}\right) \cdot \sqrt[3]{x} dx = \int \left(x^1 + x^{-\frac{1}{2}}\right) \cdot x^{\frac{1}{3}} dx = \int \left(x^{\frac{4}{3}} + x^{-\frac{1}{6}}\right) dx = \frac{x^{\frac{7}{3}}}{7/3} + \frac{x^{\frac{5}{6}}}{5/6} + C = \frac{3}{7}\sqrt[3]{x^7} + \frac{6}{5}\sqrt[6]{x^5} + C$$

$$83. \int \frac{\ln^5 6x}{3x} dx = \frac{1}{3} \cdot \int \frac{1}{x} \cdot \ln^5 6x dx = \frac{1}{3} \cdot \frac{\ln^6 6x}{6} + C = \frac{\ln^6 6x}{18} + C$$

$$84. \int \frac{3}{x \cdot \ln 2x} dx = 3 \int \frac{1}{\ln 2x} \cdot \frac{1}{x} dx = 3 \int \frac{1}{t} dt = 3 \ln|t| + C = 3 \ln|\ln 2x| + C$$

$$\ln 2x = t \Rightarrow \begin{cases} \frac{1}{\ln 2x} = \frac{1}{t} \\ \frac{1}{2x} \cdot 2 \cdot dx = dt \Rightarrow \frac{1}{x} dx = dt \end{cases}$$

$$85. \int \operatorname{sen}^2 5x \cdot \cos 5x dx = \frac{1}{5} \int \operatorname{sen}^2 5x \cdot \cos 5x \cdot 5 dx = \frac{\operatorname{sen}^3 5x}{3} + C$$

$$86. \int \frac{\sqrt{7+2tgx}}{\cos^2 x} dx = \int \frac{1}{\cos^2 x} \cdot \sqrt{7+2tgx} dx = \int \frac{1}{\cos^2 x} \cdot (7+2tgx)^{\frac{1}{2}} dx = \frac{1}{2} \cdot \int 2 \cdot \frac{1}{\cos^2 x} \cdot (7+2tgx)^{\frac{1}{2}} dx =$$

$$= \frac{(7+2tgx)^{\frac{3}{2}}}{3/2} + C = \frac{2}{3} \sqrt{(7+2tgx)^3} + C$$

$$87. \int \frac{1 - \operatorname{sen}^2 x}{\operatorname{sen} x \cdot \cos x} dx = \int \frac{\cos^2 x}{\operatorname{sen} x \cdot \cos x} dx = \int \frac{\cos x}{\operatorname{sen} x} dx = \ln|\operatorname{sen} x| + C$$

$$88. \int \operatorname{tg}(2x+1) dx = \int \frac{\operatorname{sen}(2x+1)}{\cos(2x+1)} dx = -\frac{1}{2} \int \frac{-2\operatorname{sen}(2x+1)}{\cos(2x+1)} dx = -\frac{1}{2} \ln|\cos(2x+1)| + C$$

$$89. \int \frac{x}{\sqrt{x^2+1}} dx = \int x \cdot (x^2+1)^{-\frac{1}{2}} dx = \frac{1}{2} \int 2x \cdot (x^2+1)^{-\frac{1}{2}} dx = \frac{1}{2} \cdot \frac{(x^2+1)^{\frac{1}{2}}}{1/2} + C = \frac{1}{2} \cdot 2 \cdot \sqrt{x^2+1} + C = \sqrt{x^2+1} + C$$

$$90. \int x \cdot \sqrt{x^2+1} dx = \int x \cdot (x^2+1)^{\frac{1}{2}} dx = \frac{1}{2} \int 2x \cdot (x^2+1)^{\frac{1}{2}} dx = \frac{1}{2} \cdot \frac{(x^2+1)^{\frac{3}{2}}}{3/2} + C = \frac{1}{2} \cdot \frac{2}{3} \cdot \sqrt{(x^2+1)^3} + C =$$

$$= \frac{1}{3} \sqrt{(x^2+1)^3} + C$$

$$91. \int \frac{x}{x^4+9} dx = \int \frac{x}{(x^2)^2+9} dx = \frac{1}{2} \cdot \int \frac{2x}{(x^2)^2+9} dx = \frac{1}{2} \cdot \int \frac{1}{9+(x^2)^2} \cdot 2x dx \stackrel{(*)}{=} \frac{1}{2} \cdot \frac{1}{3} \operatorname{arctg}\left(\frac{x^2}{3}\right) + C = \frac{1}{6} \operatorname{arctg}\left(\frac{x^2}{3}\right) + C$$

$$(*) \int \frac{1}{a^2 + f(x)^2} \cdot f'(x) dx = \frac{1}{a} \operatorname{arctg}\left(\frac{f(x)}{a}\right) + C$$

$$92. \int \frac{\operatorname{sen} x + \cos x}{\cos^3 x} dx = \int \frac{\operatorname{sen} x}{\cos^3 x} dx + \int \frac{\cos x}{\cos^3 x} dx = \int \operatorname{sen} x \cdot (\cos x)^{-3} dx + \int \frac{1}{\cos^2 x} dx =$$

$$= -\int -\operatorname{sen}x \cdot (\cos x)^{-3} dx + \int \sec^2 x dx = -\frac{(\cos x)^{-2}}{-2} + \operatorname{tg}x + C = \frac{1}{2} \frac{1}{\cos^2 x} + \operatorname{tg}x + C = \frac{1}{2} \sec^2 x + \operatorname{tg}x + C$$

$$93. \int \frac{\sqrt[3]{x}}{x \cdot \cos^2 \sqrt[3]{x}} dx = \int \frac{t}{t^3 \cdot \cos^2 t} 3t^2 dt = \int \frac{3}{\cos^2 t} dt = 3 \int \frac{1}{\cos^2 t} dt = 3 \int \sec^2 t dt = 3 \operatorname{tg}t + C = 3 \operatorname{tg} \sqrt[3]{x} + C$$

$$x = t^3 \Rightarrow \begin{cases} \sqrt[3]{x} = t \\ dx = 3t^2 dt \end{cases}$$

$$94. \int \frac{2e^x}{\sqrt{1-e^{2x}}} dx = 2 \int \frac{1}{\sqrt{1-(e^x)^2}} \cdot e^x dx \stackrel{(*)}{=} 2 \operatorname{arcsen}(e^x) + C$$

$$(*) \int \frac{1}{\sqrt{1-f(x)^2}} \cdot f'(x) dx = \operatorname{arcsen} f(x) + C$$

$$95. \int \frac{5x+2}{1+2x^2} dx = \int \frac{5x}{1+2x^2} dx + \int \frac{2}{1+2x^2} dx = 5 \int \frac{x}{1+2x^2} dx + 2 \int \frac{1}{1+(\sqrt{2}x)^2} dx =$$

$$= 5 \cdot \frac{1}{4} \int \frac{4x}{1+2x^2} dx + 2 \cdot \frac{1}{\sqrt{2}} \int \frac{\sqrt{2}}{1+(\sqrt{2}x)^2} dx = \frac{5}{4} \ln|1+2x^2| + \sqrt{2} \operatorname{arctg}(\sqrt{2}x) + C$$

$$96. \int \frac{1+\operatorname{tg}^2 x}{\sqrt{1+2\operatorname{tg}x}} dx = \int \frac{\sec^2 x}{\sqrt{1+2\operatorname{tg}x}} dx = \frac{1}{2} \int 2 \sec^2 x \cdot (1+2\operatorname{tg}x)^{-\frac{1}{2}} dx = \frac{1}{2} \frac{(1+2\operatorname{tg}x)^{\frac{1}{2}}}{\frac{1}{2}} + C = \sqrt{1+2\operatorname{tg}x} + C$$

$$97. \int \frac{e^{\sqrt{2x}}}{\sqrt{x}} dx = \int \frac{1}{\sqrt{x}} \cdot e^{\sqrt{2x}} dx = \sqrt{2} \int \frac{1}{\sqrt{2} \cdot \sqrt{x}} \cdot e^{\sqrt{2x}} dx = \sqrt{2} \int \frac{1}{\sqrt{2x}} \cdot e^{\sqrt{2x}} dx = \sqrt{2} \cdot e^{\sqrt{2x}} + C$$

$$y = \sqrt{2x} \Rightarrow y' = \frac{1}{2\sqrt{2x}} \cdot 2 = \frac{1}{\sqrt{2x}}$$

$$98. \int \frac{2x^3}{1+x^8} dx = \int \frac{2x^3}{1+(x^4)^2} dx = \frac{1}{2} \int \frac{2 \cdot 2x^3}{1+(x^4)^2} dx = \frac{1}{2} \int \frac{4x^3}{1+(x^4)^2} dx = \frac{1}{2} \operatorname{arctg}(x^4) + C$$

$$99. \int \frac{2^x}{1+4^x} dx = \int \frac{2^x}{1+(2^x)^2} dx = \int \frac{2^x}{1+(2^x)^2} dx = \frac{1}{\ln 2} \int \frac{2^x \cdot \ln 2}{1+(2^x)^2} dx = \frac{1}{\ln 2} \operatorname{arctg}(2^x) + C$$

$$100. \int \frac{2e^{-x}}{2+e^{-x}} dx = 2 \int \frac{e^{-x}}{2+e^{-x}} dx = -2 \int \frac{-e^{-x}}{2+e^{-x}} dx = -2 \ln|2+e^{-x}| + C$$