EJERCICIOS SOBRE INTEGRALES PARA PRACTICAR

1. $y = \int -5dx = -5x + C$

2. $y = \int \frac{-3}{5}dx = -\frac{3}{5}x + C$

3. $y = \int -6xdx = -\frac{6x^2}{2} + C = -3x^2 + C$

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

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

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

7. $y = \int (\underbrace{3x-2}_{f})^2dx = \frac{1}{3}\cdot\frac{(3x-2)^3}{3} + C$

   $f' = 3$

8. $y = \int \sqrt[3]{x}(\sqrt{x}+1)dx = \int x^{1/3}(x^{1/2}+1)dx = \int x^{5/6} + x^{1/3}dx = \frac{x^{11/6}}{11/6} + \frac{x^{4/3}}{4/3} + C$

9. $y = \int \frac{1}{x\sqrt{x}}dx = \int \frac{1}{x^{3/2}}dx = \int x^{-3/2}dx = \frac{x^{-1/2}}{-1/2} + C$

   $x \cdot x^{1/2}$

10. $y = \int (\frac{3x^4 - 2x}{3} - 3x)dx = \frac{1}{3}\int 3x^4 - 2x\,dx - \int 3x dx = \frac{1}{3}\left(\frac{3x^5}{5} - \frac{\cancel{2}x^2}{\cancel{2}}\right) - \frac{3x^2}{2} + C$

11. $y = \int (\frac{x^3 - 2x^5}{3x^2} - 2x^3)dx = \frac{1}{3}\int x - 2x^3\,dx - \int 2x^3 dx = \frac{1}{3}\left(\frac{x^2}{2} - \frac{2x^4}{4}\right) - \frac{2x^4}{4} + C$

    $\frac{x^3}{x^2} - \frac{2x^5}{x^2}$

12. $y = \int \frac{1}{3x^5\sqrt[4]{3x^3}}dx = \frac{1}{3\sqrt[4]{3}}\cdot\int \frac{1}{x^5\cdot x^{3/4}}dx = \frac{1}{3\sqrt[4]{3}}\int x^{-23/4}dx = \frac{1}{3\sqrt[4]{3}}\cdot\frac{x^{-19/4}}{-19/4} + C$

    $x^{23/4}$

13. $y = \int (\frac{2}{5x} - 3x^2)dx = \frac{2}{5}\ln|x| - \frac{\cancel{3}x^3}{\cancel{3}} + C$

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

$5x^{-3}$

15. $y = \int 2e^x - \frac{3}{2x} dx = 2e^x - \frac{3}{2} \ln|x| + C$

16. $y = \int (-2e^x - 2x^{-3} - 2)dx = -2e^x - \frac{2x^{-2}}{-2} - 2x + C$

17. $y = \int e^x(1 + \frac{e^{-x}}{x})dx = \int e^x + \frac{1}{x} dx = e^x + \ln|x| + C$

18. $y = \int (3^x - 3x^2 + x)dx = \frac{3^x}{\ln 3} - \frac{\cancel{3}x^3}{\cancel{3}} + \frac{x^2}{2} + C$

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

20. $y = \int (4^x - \frac{3x^3 - 1}{4})dx = \frac{4^x}{\ln 4} - \frac{1}{4}\left(\frac{3x^4}{4} - x\right) + C$

21. $y = \int \frac{2^x - 2x}{2} dx = \frac{1}{2} \cdot \left(\frac{2^x}{\ln 2} - \frac{\cancel{2}x^2}{\cancel{2}}\right) + C$

22. $y = \int (-2senx - 3x^2)dx = + 2\cos x - \frac{3x^3}{3} + C$

23. $y = \int (-4cosx - 3e^x + 2)dx = -4\,\text{sen}\,x - 3e^x + 2x + C$

24. $y = \int \frac{2}{cos^2 x} dx = 2\,tg\,x + C$

25. $y = \int (3 + 3tg^2 x)dx = 3 \cdot tg\,x + C$

26. $y = \int (3sec^2x - 2x)dx$ $= \int 3\frac{1}{\cos^2 x} - 2x\,dx = 3tg\,x - \frac{2x^2}{2} + C$

27. $y = \int (x - 2tg^2x)dx$ $= \int x\,dx - 2\int tg^2x \cancel{+1-1}\,dx = \frac{x^2}{2} - 2\left[\int tg^2x+1\,dx - \int 1\,dx\right] =$
$= \frac{x^2}{2} - 2tg\,x - 2x + C$

28. $y = \int (3x - 2tgx)dx$ $= \frac{3x^2}{2} - 2\int \frac{sen\,x}{\cos x}dx = \frac{3x^2}{2} + 2\ln|\cos x| + C$

29. $y = \int \frac{4}{\sqrt{4-4x^2}}dx$ $= \frac{4}{\sqrt{4}} \cdot \int \frac{1}{\sqrt{1-x^2}}dx = 2 \cdot arcsen\,x + C$

30. $y = \int \frac{8}{3+3x^2}dx$ $= \frac{8}{3} \cdot arctg\,x + C$

31. $y = \int (\underbrace{3x-5}_{f})^3dx$ $= \frac{1}{3} \cdot \frac{(3x-5)^4}{4} + C$
$f' = 3$

32. $y = \int 4x(\underbrace{2x^2-1}_{f})^4dx$ $= \frac{(2x^2-1)^5}{5} + C$
$f' = 4x$

33. $y = \int (2x+3) \cdot \sqrt[3]{\underbrace{x^2+3x}_{f}}dx$ $= \frac{(x^2+3)^{4/3}}{4/3} + C$
$f' = 2x+3$

34. $y = \int \frac{x^2+1}{\sqrt{x^3+3x}}dx$ $= \int (x^2+1)(\underbrace{x^3+3x}_{})^{-1/2}dx = \frac{1}{3} \cdot \frac{(x^3+3x)^{1/2}}{1/2} + C$
$f' = 3x^2+3$
$3(x^2+1)$

35. $y = \int \frac{5}{\sqrt[3]{2x-1}}dx$ $= \int 5 \cdot (\underbrace{2x-1}_{})^{-1/3}dx = \frac{5}{2} \cdot \frac{(2x-1)^{2/3}}{2/3} + C$
$f' = 2$

36. $y = \int \frac{2e^{-x}}{\underbrace{e^{-x}+3}_{f}}dx$ $= -2 \cdot \ln|e^{-x}+3| + C$
$f' = -e^{-x}$

37. $y = \int \frac{4x}{\underbrace{2x^2+1}_{f}}dx$ $= \ln|2x^2+1| + C$
$f' = 4x$

38. $y = \int \frac{2x^2+3x}{2x}dx = \int x + \frac{3}{2}dx = \frac{x^2}{2} + \frac{3}{2}x + C$

39. $y = \int \frac{2x-2^{+4-4}}{2x+4}dx = \int \underbrace{\frac{2x+4}{2x+4}}_{1} + \frac{-6}{\underbrace{2x+4}_{f}}dx = x - \frac{6}{2}.\ln|2x+4| + C$ $\quad f' = 2$

40. $y = \int e^{3x-1}dx = \frac{1}{3}e^{3x-1} + C$

41. $y = \int e^{\overbrace{x^3-2}^{f}}x^2dx = \frac{1}{3}e^{x^3-2} + C$ $\quad f' = 3x^2$

42. $y = \int 2^{\overbrace{4x-1}^{f}}dx = \frac{1}{4}.\frac{2^{4x-1}}{\ln 2} + C$ $\quad f' = 4$

43. $y = \int (3^{\overbrace{x^2-1}^{f}} \cdot 2x)dx = \frac{3^{x^2-1}}{\ln 3} + C$

44. $y = \int 2^x sen(\underbrace{2^x+3}_{f})dx = \frac{-1}{\ln 2}.\cos(2^x+3) + C$ $\quad f' = 2^x \ln 2$

45. $y = \int \frac{2}{cos^2(x+2)}dx = 2\,tg(x+2) + C$

46. $y = \int (tg^2(3x-1))dx = \int -1+1+tg^2(3x-1)\,dx = \int -1\,dx + \int 1+tg^2(\underbrace{3x-1}_{f})\,dx$ $\quad f' = 3$

$= -x + \frac{1}{3}.tg(3x-1) + C$

47. $y = \int \frac{-2x}{\underbrace{1+9x^2}_{f}}dx = -\frac{1}{9}.\ln|1+9x^2| + C$ $\quad f' = 18x$

48. $y = \int \frac{1}{1+3x^2}dx = \int \frac{1}{1+(\sqrt{3}x)^2}dx = \frac{1}{\sqrt{3}}\,arctg(\sqrt{3}x) + C$

49. $y = \int \frac{2x}{1+9x^4}dx = \int \frac{2x}{1+(\underbrace{3x^2}_{f})^2}dx = \frac{1}{3}.arctg(3x^2) + C$ $\quad f' = 6x$

50. $y = \int \frac{3x}{1+x^4}dx = \int \frac{3x}{1+(\underbrace{x^2}_{f})^2}dx = \frac{3}{2}.arctg(x^2) + C$ $\quad f' = 2x$

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51. $y=\int \frac{e^x}{\sqrt{1-e^x}}dx = \int e^x \cdot (\underbrace{1-e^x}_{f})^{-1/2} dx = -\frac{(1-e^x)^{1/2}}{1/2}+C$

$f' = -e^x$

C.V

52. $y=\int \frac{1}{1+e^t}dt \overset{*}{=} \int \frac{1}{1+x}\frac{dx}{x} = \int \frac{1}{x(x+1)}dx \overset{\Delta}{=} \int \frac{1}{x}+\frac{-1}{x+1}dx = Ln|x| - Ln|x+1| + C$

$* \left[\begin{array}{l} x=e^t \\ dx = e^t dt \; ; \; dt = \frac{dx}{e^t} = \frac{dx}{x} \end{array} \right]$

$\Delta \left[\left. \begin{array}{l} \frac{1}{x(x+1)} = \frac{A}{x} + \frac{B}{x+1} \\ 1 = A(x+1) + Bx \end{array} \right\} \Rightarrow \begin{array}{ll} x=0 & 1=A \\ x=-1 & 1=-B \quad B=-1 \end{array} \right]$

Partes

53. $y=\int xe^{3x}dx \overset{*}{=} x\cdot\frac{1}{3}e^{3x} - \int \frac{1}{3}e^{3x}dx = \frac{x}{3}e^{3x} - \frac{1}{9}e^{3x}+C$

$* \left[\begin{array}{ll} u=x & du=dx \\ dv=e^{3x}dx & v=\frac{1}{3}e^{3x} \end{array} \right]$

54. $y=\int\left(\frac{3-x}{8}-\frac{1}{x^2+3}\right)dx = \frac{1}{8}\int 3-x\,dx - \int \frac{1}{3(\frac{x^2}{3}+1)}dx = \frac{1}{8}\left(3x-\frac{x^2}{2}\right) - \frac{1}{3}\int \frac{1}{\left(\underbrace{\frac{x}{\sqrt{3}}}_{f}\right)^2+1}dx =$

$= \frac{1}{8}\left(3x-\frac{x^2}{2}\right) - \frac{1}{3}\cdot\frac{1}{1/\sqrt{3}}\cdot \text{arctg}\left(\frac{x}{\sqrt{3}}\right)+C \qquad f'=\frac{1}{\sqrt{3}}$

55. $y=\int \frac{x^2+3x+1}{x}dx = \int x+3+\frac{1}{x}dx = \frac{x^2}{2}+3x+Ln|x|+C$

56. $y=\int \frac{x}{\underbrace{x^2+1}_{f}}dx = \frac{1}{2}Ln|x^2+1|+C$

$f'=2x$

57. $y=\int(\underbrace{\sqrt[3]{x+1}}_{(x+1)^{1/3}}-\underbrace{\sqrt[3]{x}}_{x^{1/3}})dx = \frac{(x+1)^{4/3}}{4/3} - \frac{x^{4/3}}{4/3}+C$

58. $y=\int \frac{senx}{\underbrace{2-cosx}_{f}}dx = Ln|2-cosx|+C$

$f' = senx$

59. Sean las funciones $F(x)=\int \sqrt{5+e^{t^4}}dt$ y $g(x)=x^2$. Calcular $(F(g(x)))'$

R. cadena: $F'(g(x))\cdot g'(x) = \sqrt{5+e^{(x^2)^2}}\cdot 2x = \sqrt{5+e^{x^4}}\cdot 2x$

60. $y=\int \frac{(2x-1)^2}{4x^2+1}dx = \int \frac{4x^2-4x+1}{4x^2+1}dx = \int \underbrace{\frac{4x^2+1}{4x^2+1}}_{=1} dx - \int \frac{4x}{\underbrace{4x^2+1}_{f \quad f'=8x}}dx = x - \frac{1}{2}\ln|4x^2+1| + C$

61. $y=\int \frac{2x+1}{(x^2+x+1)^2}dx = \int \underbrace{(2x+1)}_{f'}\underbrace{(x^2+x+1)}_{f}^{-2}dx = \frac{(x^2+x+1)^{-1}}{-1}+C = \frac{-1}{x^2+x+1}+C$

62. $y=\int \frac{senx}{\underbrace{2-cosx}_{f'=senx}}dx = \ln|2-\cos x|+C$

63. $y=\int \frac{e^x}{(1+e^x)^2}dx = \int \underbrace{e^x}_{f'}(\underbrace{1+e^x}_{f})^{-2}dx = \frac{(1+e^x)^{-1}}{-1}+C = \frac{-1}{1+e^x}+C$

64. $y=\int \frac{-4x}{(1+x^2)^2}dx = \int 4x(\underbrace{1+x^2}_{f \quad f'=2x})^{-2}dx = -2\cdot\frac{(1+x^2)^{-1}}{-1}+C = \frac{2}{1+x^2}+C$

65. $y=\int \left(\frac{1}{(x-2)^2}-1\right)dx = \int (x-2)^{-2}dx - x = \frac{(x-2)^{-1}}{-1} - x + C = \frac{-1}{x-2} - x + C$

66. $y=\int \frac{x^2+1}{e^x}dx = \int e^{-x}(x^2+1)dx \overset{*}{=} (x^2+1)\cdot(-e^{-x}) - \int -e^{-x}\cdot 2x\,dx \overset{\Delta}{=}$

PARTES

$* \begin{bmatrix} u = x^2+1 & du = 2x\,dx \\ dv = e^{-x}dx & v = -e^{-x} \end{bmatrix}$

$\Delta \begin{bmatrix} u = 2x & du = 2dx \\ dv = e^{-x}dx \to & v = -e^{-x} \end{bmatrix}$

$\overset{\Delta}{=} (x^2+1)(-e^{-x}) + \left[2x\cdot(-e^{-x}) - \int -e^{-x}2dx\right] = (x^2+1)(-e^{-x}) - 2xe^{-x} - 2e^{-x}+C$

PARTES

67. $y = \int x^3 Ln(x)dx \overset{(*)}{=} Lnx \cdot \frac{x^4}{4} - \int \underbrace{\frac{x^4}{4} \cdot \frac{1}{x}}_{\frac{1}{4}x^3} dx = \frac{x^4}{4} \cdot Lnx - \frac{1}{4}\frac{x^4}{4} + C$

$(*) \left[\begin{array}{ll} u = Lnx & \rightarrow du = \frac{1}{x}dx \\ dv = x^3 dx & \quad v = \frac{x^4}{4} \end{array} \right]$

C.V

68. $y = \int \frac{1+e^x}{1-e^x} dx$. Usar el cambio $t=e^x$. $I = \int \frac{1+t}{1-t} \cdot \frac{dt}{t} \overset{*}{=} \int \frac{2}{1-t} + \frac{1}{t} dt = -2Ln|1-t| + Ln|t| = -2Ln|1-e^x| + Ln|e^x| + C$

$\left[\begin{array}{l} dt = e^x dx \rightarrow dx = \frac{dt}{e^x} = \frac{dt}{t} \\ t = e^x \end{array} \right]$

$* \left[\begin{array}{l} \frac{1+t}{(1-t)t} = \frac{A}{1-t} + \frac{B}{t} = \frac{At + B(1-t)}{(1-t)t} \\ 1+t = At + B(1-t) < \begin{array}{l} t=0 \\ t=1 \end{array} \quad \begin{array}{l} 1 = B \\ 2 = A \end{array} \end{array} \right]$

69. $y = \int \frac{1+x+x^4}{x^3} dx = \int \underbrace{\frac{1}{x^3}}_{x^{-3}} + \underbrace{\frac{x}{x^3}}_{x^{-2}} + \underbrace{\frac{x^4}{x^3}}_{x} dx = \frac{x^{-2}}{-2} + \frac{x^{-1}}{-1} + \frac{x^2}{2} + C$

70. $y = \int \underbrace{(2x+1)}_{f}{}^3 dx = \frac{1}{2} \cdot \frac{(2x+1)^4}{4} + C$ $\quad f' = 2$

71. $y = \int \frac{x}{\sqrt{4-x^2}} dx = \int x \, \underbrace{(4-x^2)}_{f}{}^{-1/2} dx = -\frac{1}{2} \cdot \frac{(4-x^2)^{1/2}}{1/2} + C$ $\quad f' = -2x$

PARTES

72. $y = \int x cos x dx \overset{*}{=} x \cdot senx - \int senx dx = xsenx + cosx + C$

$* \left[\begin{array}{ll} u = x & \rightarrow du = dx \\ dv = cosx dx & \quad v = senx \end{array} \right]$

RACIONAL

73. $y = \int \frac{x-1}{(x+1)^2} dx \overset{(*)}{=} \int \frac{1}{x+1} dx + \int \frac{-2}{(x+1)^2} dx = Ln|x+1| - 2\int (x+1)^{-2} dx =$

$= Ln|x+1| - 2 \cdot \frac{(x+1)^{-1}}{-1} + C =$

$= Ln|x+1| + \frac{2}{x+1} + C$

$\left[\begin{array}{l} \frac{x-1}{(x+1)^2} = \frac{A}{x+1} + \frac{B}{(x+1)^2} = \frac{A(x+1)+B}{(x+1)^2} \\ x-1 = A(x+1) + B \\ x=-1 \rightarrow -2 = B \\ x=0 \rightarrow -1 = A-2 ; \; A=1 \end{array} \right] (*)$

74. $y = \int x\sqrt{4+5x^2} dx = \frac{1}{10} \cdot \frac{(4+5x^2)^{3/2}}{3/2} + C$ $\quad f' = 10x$

PARTES

75. $y=\int x^2 senx dx \overset{*}{=} x^2\cdot(-\cos x) - \int -\cos x\, 2x\, dx = -x^2\cos x + 2\cdot\int x\cos x\, dx \overset{\Delta}{=} -x^2\cos x + 2\cdot\left[x\, sen x - \int sen x\, dx\right] =$

$= -x^2\cos x + 2x\, sen x + 2\cos x + C$

$\left.\begin{matrix} u=x^2 \\ dv = sen x\, dx \end{matrix}\right\} \to \begin{matrix} du = 2x\, dx \\ v = -\cos x \end{matrix}$ *

$\Delta \left[\begin{matrix} u=x \to du = dx \\ dv = \cos x\, dx \to v = sen x \end{matrix}\right]$

PARTES

76. $y=\int Lnx dx = Lnx\cdot x - \int \cancel{x}\cdot\frac{1}{\cancel{x}}dx = x\cdot Lnx - x + C$

$\left[\begin{matrix} u = Lnx \\ dv = dx \end{matrix} \to \begin{matrix} du = \frac{1}{x}dx \\ v = x \end{matrix}\right]$

77. $y=\int Ln^2 x dx = \int (Lnx)^2 dx \overset{*}{=} (Lnx)^2\cdot x - \int \cancel{x}\cdot 2Lnx\,\frac{1}{\cancel{x}}dx = (Lnx)^2\cdot x - 2\int Lnx\, dx = (Lnx)^2\cdot x - 2\cdot[xLnx - x] + C$

$\left.\begin{matrix} u=(Lnx)^2 \\ dv = dx \end{matrix}\right\} \begin{matrix} du = 2Lnx\cdot\frac{1}{x} \\ v = x \end{matrix}$ *

78. $y=\int\frac{x-3}{x^2+9}dx = \int \frac{x}{\underbrace{x^2+9}_{f}}dx - \int\frac{3}{x^2+9}dx = \frac12\cdot Ln|x^2+9| - 3\cdot\int\frac{1}{9(\frac{x^2}{9}+1)}dx = \frac12 Ln|x^2+9| - \frac39\cdot\int\frac{1}{(\frac{x}{3})^2+1}dx =$

$f' = 2x$

$f \quad f' = 1/3$

$= \frac12 Ln|x^2+9| - \frac13\cdot\frac{1}{1/3}\int\frac{1/3}{1+(\frac{x}{3})^2}dx = \frac12 Ln|x^2+9| - arctg\left(\frac{x}{3}\right) + C$

79. $y=\int\frac{3-x^2+x^4}{x^3}dx = \int \underbrace{\frac{3}{x^3}}_{3x^{-3}} - \frac1x + x\, dx = \frac{3\cdot x^{-2}}{-2} - Lnx + x^2 + C$

80. $y=\int\frac{1}{1-4x^2}dx = \frac12\cdot\int\frac{1}{\underbrace{1-2x}_{f}}dx + \frac12\cdot\int\frac{1}{1+2x}dx = \frac12\cdot\frac{1}{-2}\cdot Ln|1-2x| + \frac12\cdot\frac12 Ln|1+2x| + C$

$(1-2x)(1+2x)$ $\quad f' = -2$

$\frac{1}{1-4x^2} = \frac{A}{1-2x} + \frac{B}{1+2x} = \frac{A(1+2x)+B(1-2x)}{1-4x^2}$

$1 = A(1+2x) + B(1-2x) \Rightarrow x = 1/2 \to 1 = 2A \quad A = 1/2$

$x = -1/2 \to 1 = 2B \quad B = 1/2$

Racional

81. $y=\int\frac{x}{x+4}dx = \int\frac{x+4-4}{x+4}dx = \int\frac{x+4}{x+4} - \frac{4}{x+4}dx = \int 1 - \frac{4}{x+4}dx = x - 4Ln|x+4| + C$

PARTES

82. $y=\int(xe^x+3)dx = \int xe^x dx + \int 3dx \overset{*}{=} x\cdot e^x - \int e^x dx + 3x = xe^x - e^x + 3x + C$

* $\left[\begin{matrix} u = x \\ dv = e^x dx \end{matrix} \to \begin{matrix} du = dx \\ v = e^x \end{matrix}\right]$

PARTES

83. $y = \int (3x+5)cosx dx \underset{*}{=} (3x+5)\,senx - \int senx\, 3dx = (3x+5)senx + 3\cos x + C$

$* \left[\begin{array}{ll} u = 3x+5 & \rightarrow du = 3\,dx \\ dv = \cos x\,dx & \quad\; v = senx \end{array} \right]$

84. $y = \int \frac{Ln(x+1)}{x+1}dx = \int \frac{1}{x+1} \cdot Ln(x+1)\,dx = Ln|x+1| \cdot Ln|x+1| - \int Ln|x+1| \cdot \frac{1}{x+1}\,dx$

$\left[\begin{array}{ll} u = Ln(x+1) & \rightarrow du = \frac{1}{x+1}dx \\ dv = \frac{1}{x+1}\,dx & \quad\; v = Ln|x+1| \end{array} \right]$

$I = (Ln|x+1|)^2 - I$

$2I = (Ln|x+1|)^2$

$I = \frac{Ln(x+1)^2}{2} + C$

85. $y = \int \frac{x}{\underbrace{x^2-4}_{f}}dx = \frac{1}{2} \cdot Ln|x^2-4| + C$

$f' = 2x$

PARTES

86. $y = \int (1-x)e^{-x}dx \underset{\circledast}{=} (1-x)\cdot(-e^{-x}) - \int -e^{-x}\cdot(-dx) = -(1-x)e^{-x} - \int e^{-x}dx = (1-x)e^{-x} + e^{-x} + C$

$\left[\begin{array}{ll} u = 1-x & \rightarrow du = -dx \\ dv = e^{-x}\,dx & \quad\; v = -e^{-x} \end{array} \right] \circledast$

87. $y = \int (x-2)\underbrace{\sqrt{x^2-4x+3}}dx = \frac{1}{2}\frac{(x^2-4x+3)^{3/2}}{3/2} + C$

$f' = 2x-4$
$2(x-2)$

88. $y = \int \frac{x^2+x+6}{x-2}dx = \int x+3 + \frac{12}{x-2}\,dx = \frac{x^2}{2} + 3x + 12 \cdot Ln|x-2| + C$

$\begin{array}{r|l} \cancel{x^2} + x + 6 & x-2 \\ \hline -\cancel{x^2} + 2x & x+3 \\ \hline \cancel{3x} + 6 & \\ -\cancel{3x} + 6 & \\ \hline 12 & \end{array}$

89. $y = \int \frac{1-x^2}{x^2+1}dx = \int -1 + \frac{2}{x^2+1}dx = -x + 2\,arctg\,x + C$

$\begin{array}{r|l} -\cancel{x^2} + 1 & x^2+1 \\ \hline \cancel{x^2} + 1 & -1 \\ \hline 2 & \end{array}$

PARTES

90. $y = \int (6-x)e^{\frac{x-4}{3}}dx \underset{*}{=} (6-x)\cdot 3e^{\frac{x-4}{3}} + \int 3e^{\frac{x-4}{3}}\cdot dx = (6-x)3e^{\frac{x-4}{3}} + 9\cdot e^{\frac{x-4}{3}} + C$

$\left[\begin{array}{ll} u = 6-x & \rightarrow du = -dx \\ dv = e^{\frac{x-4}{3}}\,dx & \quad\; v = 3e^{\frac{x-4}{3}} \end{array} \right] *$

PARTES 91. $y = \int x^2 Lnx dx$ $= Lnx \cdot \frac{x^3}{3} - \int \frac{x^3}{3} \cdot \frac{1}{x} dx = Lnx \cdot \frac{x^3}{3} - \frac{1}{3}\frac{x^3}{3} + C$

$\frac{1}{3}x^2$

$\left[\begin{array}{ll} u = Lnx & du = \frac{1}{x}dx \\ dv = x^2 dx \Rightarrow & v = \frac{x^3}{3} \end{array}\right]$

92. $y = \int \frac{Lnx}{x} dx$ $\quad f \quad f' = \frac{1}{x}$ $= \int \frac{1}{x} \cdot Lnx \, dx = \frac{(Lnx)^2}{2} + C$

otra forma

$\left[\begin{array}{l} t = Lnx \\ dt = \frac{1}{x}dx \end{array}, \; dx = x\,dt \right] I = \int \frac{t}{\cancel{x}} \cdot \cancel{x} dt = \frac{t^2}{2} + C = \frac{(Lnx)^2}{2} + C$

C.V 93. $y = \int (senx)^4 (cosx)^3 dx$ $= \int t^4 \cdot (cosx)^3 \cdot \frac{dt}{cosx} = \int t^4 \cdot (cosx)^2 \cdot dt =$

$\left.\begin{array}{l} t = senx \\ dt = cosx\,dx \end{array}\right]$

$\hookrightarrow dx = \frac{dt}{cosx}$

$= \int t^4 \cdot (1 - sen^2 x)\, dt = \int t^4 (1 - t^2)\, dt =$

$= \int t^4 - t^6 \, dt = \frac{t^5}{5} - \frac{t^7}{7} = \frac{(senx)^5}{5} - \frac{(senx)^7}{7} + C$