

Integrales propuestas

$$1) \int (x^2 + 3x) dx$$

$$2) \int (6x^2 + 3x + 3) dx$$

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

$$4) \int (x^5 + 4x) dx$$

$$5) \int (x - 1)^3 dx$$

$$6) \int (4x^3 - 7x^2 + 5x + 1) dx$$

$$7) \int \sqrt[5]{x^2} dx$$

$$8) \int \sqrt[3]{x} dx$$

$$9) \int \frac{dx}{\sqrt[7]{x^6}}$$

$$10) \int \frac{dx}{\sqrt[7]{x^5}}$$

$$11) \int \frac{2}{x} dx$$

$$12) \int (x - 1)(x^2 + x + 1) dx$$

$$13) \int (x^2 + 4x)(x^2 - 1) dx$$

$$14) \int (x^3 - 3x^4 + 5x^2 - 1) dx$$

$$15) \int (x^7 - 3x) dx$$

$$16) \int (4x^2 - 5x + 7) dx$$

$$17) \int (x - \sin x) dx$$

$$18) \int (x + \cos x) dx$$

$$19) \int (x - 2 \tan x) dx$$

$$20) \int (\sin x + e^x) dx$$

$$21) \int (\cos x - 5e^x) dx$$

$$22) \int (e^x - e^{-x}) dx$$

$$23) \int (e^x + 3e^{-x}) dx$$

$$24) \int \frac{3}{x - 5} dx$$

$$25) \int \frac{1}{2x - 7} dx$$

$$26) \int \frac{3}{1 + x^2} dx$$

$$27) \int \frac{2}{1 + 4x^2} dx$$

$$28) \int (2^x - x^2) dx$$

$$29) \int e^{x+2} dx$$

$$30) \int \sqrt{x} \sqrt{x} dx$$

$$31) \int \frac{1}{3 - x} dx$$

$$32) \int \frac{2x}{\sqrt{1 - x^2}} dx$$

$$33) \int \frac{\cos x}{\sin x} dx$$

$$34) \int \tan x dx$$

$$35) \int \frac{1}{1 + x} dx$$

$$36) \int \frac{e^x + 1}{e^x + x} dx$$

$$37) \int \frac{2x}{1 + x^4} dx$$

$$38) \int \frac{1}{x - 4} dx$$

$$39) \int \cos(-x) dx$$

$$40) \int \sin(2x + 1) dx$$

$$41) \int \sin(2 - 3x) dx$$

$$42) \int \cos\left(\frac{2x + 1}{3}\right) dx$$

$$43) \int \frac{-3x}{2 - 6x^2} dx$$

$$44) \int \frac{5}{\cos^2 x} dx$$

$$45) \int \frac{3}{\sqrt{1 - x^2}} dx$$

$$46) \int \frac{2}{\sqrt{1 - 4x^2}} dx$$

47) $\int \frac{2x-5}{x^2-5x+6} dx$

48) $\int \sin x \cos^4 x dx$

49) $\int \sin\left(\frac{x}{2}\right) dx$

50) $\int \frac{-3x^3}{1+x^4} dx$

51) $\int \frac{x^2}{1+x^3} dx$

52) $\int \frac{1}{(x+2)^3} dx$

53) $\int \cot g x dx$

54) $\int e^{7x} dx$

55) $\int e^{-2x+3} dx$

56) $\int x \cdot e^{x^2} dx$

57) $\int x^2 \cdot e^{x^3} dx$

58) $\int \cos 3x dx$

59) $\int x \cdot \sin(x^2+4) dx$

60) $\int \frac{2x}{1+x^4} dx$

61) $\int \frac{2x^3}{1+x^4} dx$

62) $\int \frac{e^x}{1+e^{2x}} dx$

63) $\int \frac{dx}{\sqrt{9-x^2}}$

64) $\int \frac{dx}{1+4x^2}$

65) $\int \frac{xdx}{\sqrt{1-4x^2}}$

66) $\int \frac{1}{\cos^2 3x} dx$

67) $\int \frac{1+\cos x}{x+\sin x} dx$

68) $\int \frac{5e^x}{1+e^{2x}} dx$

69) $\int 5x \cdot e^{3x^2+3} dx$

70) $\int \arcsin x dx$

71) $\int \arccos x dx$

72) $\int \arctan x dx$

73) $\int x \cdot \sin x dx$

74) $\int x \cdot \cos x dx$

75) $\int x^2 \cdot \cos x dx$

76) $\int x^2 \cdot \sin x dx$

77) $\int x \cdot e^x dx$

78) $\int x^2 \cdot e^x dx$

79) $\int x^3 \cdot e^x dx$

80) $\int e^x \sin x dx$

81) $\int e^x \cos x dx$

82) $\int \ln x dx$

83) $\int x \cdot \ln x dx$

84) $\int (x^2-7x+12) dx$

85) $\int (x^3-12x^2+14x-5) dx$

86) $\int \left(x^5-7+\frac{4}{x^2}\right) dx$

87) $\int \left(6x^2-\frac{6}{x}+\frac{8}{x^3}\right) dx$

88) $\int \frac{x^3-7x^2+4}{x} dx$

89) $\int \frac{x^3-5x+3}{x} dx$

90) $\int (x^2-5)^2 dx$

91) $\int (x+4)^3 dx$

92) $\int \frac{x^3-5x+3}{x-2} dx$

93) $\int \frac{\sqrt{3x^3}}{\sqrt[3]{x^2}} dx$

94) $\int \frac{\sqrt{3x^3}}{\sqrt[3]{5x^2}} dx$

$$95) \int \frac{\sqrt{3x-5}}{\sqrt[3]{2x}} dx$$

$$96) \int \frac{(x^2-1)^2}{\sqrt{x}} dx$$

$$97) \int (2x+3)^3 \sqrt{x} dx$$

$$98) \int (\sqrt[3]{x^2} - 3\sqrt{x} + 12) dx$$

$$99) \int \frac{3x+2}{\sqrt{x}} dx$$

$$100) \int 5x\sqrt{x^2+7} dx$$

$$101) \int x^3 \cdot \sqrt[3]{x-12} dx$$

$$102) \int x(2x^2-7)^{99} dx$$

$$103) \int \frac{4x dx}{\sqrt[3]{8-x^2}}$$

$$104) \int (3x^2-1)^{240} x dx$$

$$105) \int (2-7x)^{2/3} dx$$

$$106) \int \frac{dx}{(3x+1)^5}$$

$$107) \int x \cdot \sqrt{2x^2+17} dx$$

$$108) \int \frac{x+1}{\sqrt[3]{x^2+2x+12}} dx$$

$$109) \int \sqrt{x^2-2x+3} \cdot (x-1) dx$$

$$110) \int \cos 5x dx$$

$$111) \int \sin 2x \cos 2x dx$$

$$112) \int e^{\sin x} \cos x dx$$

$$113) \int e^{-5x} dx$$

$$114) \int \frac{e^{-2x} \cdot e^{2x}}{2} dx$$

$$115) \int \sin^2 \frac{x}{2} \cdot \cos \frac{x}{2} dx$$

$$116) \int \tan x \cdot \sec^2 x dx$$

$$117) \int \sin^2 4x dx$$

$$118) \int \cos^3 3x dx$$

$$119) \int \cos^5 x dx$$

$$120) \int \frac{x^2-4}{x-3} dx$$

$$121) \int (2^x + x^2) dx$$

$$122) \int \frac{x^2}{x^3+2} dx$$

$$123) \int x^2 \cdot \sin x^3 dx$$

$$124) \int \frac{-3x}{1+x^4} dx$$

$$125) \int \frac{2x}{4+x^4} dx$$

$$126) \int x^3 dx$$

$$127) \int \frac{x^4}{3} dx$$

$$128) \int \frac{x^5}{6} dx$$

$$129) \int (x^2+3) dx$$

$$130) \int \left(x^3 + 2x - \frac{1}{x} \right) dx$$

$$131) \int \frac{x^4 - x^2 + 1}{x} dx$$

$$132) \int \frac{dx}{x^2}$$

$$133) \int \frac{1}{x^4} dx$$

$$134) \int \frac{x^4 - 2x + 3}{x^7} dx$$

$$135) \int \frac{x^5}{1+x} dx$$

$$136) \int \frac{4\sqrt[3]{x}}{3} dx$$

$$137) \int \frac{dx}{\sqrt[3]{x}}$$

$$138) \int \left(\frac{8}{3} \sqrt[3]{x^5} + 6\sqrt{x} \right) dx$$

$$139) \int \sqrt[3]{x} \cdot (\sqrt{x} + 3) dx$$

$$140) \int (x - \sin x + 2 \cos x) dx$$

$$141) \int \left(e^x - \frac{1}{x} \right) dx$$

142) $\int \frac{dx}{4x-2}$

143) $\int \frac{dx}{2-x}$

144) $\int \frac{x}{1-x^2} dx$

145) $\int \frac{3dx}{(x+1)^4}$

146) $\int \frac{x^3}{1+x^4} dx$

147) $\int \frac{\sin 2x}{1+\sin^2 x} dx$

148) $\int \frac{x+2}{\sqrt{x^2+4x+2}} dx$

149) $\int e^x \sqrt{1-e^x} dx$

150) $\int \frac{\ln x}{x} dx$

151) $\int x\sqrt{x^2+5} dx$

152) $\int \sin 7x dx$

153) $\int 8x \cos x^2 dx$

154) $\int \frac{\cos x}{1+\sin^2 x} dx$

155) $\int \frac{dx}{\cos^2 x \sqrt{1-\tan^2 x}}$

156) $\int 4x^2 \cdot e^{x^3} dx$

157) $\int \frac{3x^2}{1+x^6} dx$

158) $\int 3^x dx$

159) $\int \frac{dx}{x^2+4}$

160) $\int e^{5x} dx$

161) $\int (e^x + e^{-x})^2 dx$

162) $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$

163) $\int \frac{\sin x}{e^{\cos x}} dx$

164) $\int x^2 \ln x dx$

165) $\int x \arctan x dx$

166) $\int \frac{x+2}{x^2+x-6} dx$

167) $\int \frac{dx}{x^2+5x+6}$

168) $\int \frac{x^3+1}{x^2+x-2} dx$

169) $\int \frac{1}{x^2+3x} dx$

170) $\int \frac{1}{\sin x \cos x} dx$

171) $\int \frac{2x-3}{x+2} dx$

172) $\int \frac{dx}{x^2-4}$

173) $\int \frac{x-1}{x^2+x-6} dx$

174) $\int \frac{2}{x^2+5x+6} dx$

175) $\int \frac{x+1}{x \cdot (x-1)^2} dx$

176) $\int \frac{dx}{x^2+2x}$

177) $\int \frac{x^2+1}{x^2+x-6} dx$

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

179) $\int \frac{x^2+1}{x^2-1} dx$

180) $\int \frac{1}{x^2 \cdot (x+1)} dx$

181) $\int \frac{1}{x^2-9} dx$

182) $\int \frac{x}{(x-1)^2 \cdot (x+1)} dx$

183) $\int \frac{6}{x \cdot (x-1) \cdot (x+2)} dx$

184) $\int \frac{3}{x^3-1} dx$

185) $\int \frac{5x^2-2x+25}{x^3-6x^2+25x} dx$

$$186) \int (1-x)^2 dx$$

$$187) \int (1-x^2)^2 dx$$

$$188) \int 2x \sqrt{x^2+3} dx$$

$$189) \int x(x^2+3) dx$$

$$190) \int (x-2)(x^2-4x+1)^3 dx$$

$$191) \int \sqrt{2x-1} dx$$

$$192) \int x \sqrt{x^2-2} dx$$

$$193) \int e^{2x} dx$$

$$194) \int (x+1) \cdot e^{x^2+2x-1} dx$$

$$195) \int \frac{4x}{2x^2+1} dx$$

$$196) \int \frac{x^2}{x^2+3} dx$$

$$197) \int \frac{x+1}{x^2+2x} dx$$

$$198) \int \frac{5x}{1-x^2} dx$$

$$199) \int \frac{4x^3}{x^4+2} dx$$

$$200) \int \frac{4x^3}{(x^4+2)^2} dx$$

$$201) \int \frac{4x^3}{\sqrt[3]{x^4+2}} dx$$

$$202) \int \frac{x-1}{\sqrt{x^2-2x}} dx$$

$$203) \int 3^{x/2} dx$$

$$204) \int e^{x+1} dx$$

$$205) \int \left(\frac{1}{e}\right)^{4x} dx$$

$$206) \int (e^{-3x} + e^{x-2}) dx$$

$$207) \int 7^{x^2+1} \cdot 2x \cdot dx$$

$$208) \int 5e^{x/2+2} dx$$

$$209) \int \frac{3^{5x-1}}{7} dx$$

$$210) \int \frac{x}{e^{x^2}} dx$$

$$211) \int \sec(2x) dx$$

$$212) \int \cos(x+1) dx$$

$$213) \int \frac{\sec\left(\frac{x}{2}\right)}{2} dx$$

$$214) \int \sec(-x) dx$$

$$215) \int \frac{1}{\cos^2(x+1)} dx$$

$$216) \int -3 \cdot \sec(2x+1) dx$$

$$217) \int (x+1) \cdot \cos(x^2+2x) dx$$

$$218) \int \frac{x}{\cos^2(x^2-3)} dx$$

$$219) \int \frac{1}{\sqrt{1-25x^2}} dx$$

$$220) \int \frac{1}{\sqrt{1-(2x-3)^2}} dx$$

$$221) \int \frac{x}{1+(x-3)^2} dx$$

$$222) \int \frac{x}{1+9x^4} dx$$

$$223) \int (x^2+x) \cdot e^{-2x+1} dx$$

$$224) \int x^2 \cdot \cos(3x) dx$$

$$225) \int 2x^2 \cdot \ln x dx$$

$$226) \int x^2 \cdot 2^x dx$$

$$227) \int \frac{2}{x^2-1} dx$$

$$228) \int \frac{-3}{x^2+x-2} dx$$

$$229) \int \frac{2x+1}{x^4-5x^2+4} dx$$

$$230) \int \frac{7x-2}{x^3-2x^2-x+2} dx$$

$$231) \int \frac{x^2}{(x-1)^3} dx$$

$$232) \int -\frac{3x-2}{(2-x)^2} dx$$

$$233) \int \frac{-2x^2+1}{x^3+6x^2+12x+8} dx$$

$$234) \int \frac{x-2}{x^4} dx$$

$$235) \int \frac{4x^2-2x}{(x+2)(x-3)^2} dx$$

$$236) \int \frac{-x^2+7x}{x^3-x^2-x+1} dx$$

$$237) \int \frac{2}{x^2+1} dx$$

$$238) \int -\frac{3x-2}{2+x^2} dx$$

$$239) \int \frac{-2x^2+1}{x^3-x^2+3x-3} dx$$

$$240) \int \frac{x-2}{x^2(x^2+1)} dx$$

$$241) \int \frac{2x^4}{(x-1)^3} dx$$

$$242) \int -\frac{3x^3-2}{(2-x)^2} dx$$

$$243) \int \frac{-2x^5+1}{x^4-2x^2+1} dx$$

$$244) \int \frac{x^6-1}{x^2(x^2+1)(x-1)} dx$$

$$245) \int x \cdot 2^{x^2-3} dx$$

$$246) \int \frac{\ln^3 x}{2x} dx$$

$$247) \int x \cdot \ln(1+x^2) dx$$

$$248) \int \frac{1}{e^x+e^{-x}} dx$$

$$249) \int \frac{x^2+2}{\sqrt{x^3+6x}} dx$$

$$250) \int \frac{x}{1+x^4} dx$$

$$251) \int \frac{\operatorname{arctg}(x)}{1+x^2} dx$$

$$252) \int \frac{dx}{(\operatorname{arcsen} x)^5 \cdot \sqrt{1+x^2}}$$

$$253) \int \operatorname{sen}^5 x \cdot \cos^2 x dx$$

$$254) \int \sqrt{4-x^2} dx$$

$$255) \int \operatorname{sen}^2 x dx$$

$$256) \int \frac{\sqrt{2-x^2}}{4} dx$$

$$257) \int (2x-3) dx$$

$$258) \int (3x^2+4x-2) dx$$

$$259) \int \left(\frac{3}{4}x^3 - 3x^2 + 6x - 1 \right) dx$$

$$260) \int \frac{7}{\operatorname{sen}^2(3x)} dx$$

$$261) \int 3 \cdot \sec^2\left(\frac{1}{5}x\right) dx$$

$$262) \int \frac{2x+\sqrt{x}}{x^2} dx$$

$$263) \int \frac{1-\operatorname{sen} x}{2x+2\cos x} dx$$

$$264) \int \operatorname{ln}\left(\frac{x+1}{x-1}\right)^x dx$$

$$265) \int x \cdot \operatorname{ln}^2 x dx$$

$$266) \int x \cdot \operatorname{arctg}(x+1) dx$$

$$267) \int \frac{x \cdot \operatorname{arcsen}(x)}{\sqrt{1-x^2}} dx$$

$$268) \int \frac{\sqrt{1+\sqrt{x}}}{\sqrt{x}} dx$$

$$269) \int \frac{x^4}{\sqrt{1-x^{10}}} dx$$

$$270) \int e^x \cdot \sqrt{(e^x+1)^3} dx$$

$$271) \int \cos^3 x \cdot \operatorname{sen}^5 x dx$$

$$272) \int \operatorname{sen}^3 x \cdot \cos^{15} x dx$$

$$273) \int \frac{\sec^3 x}{\cos^2 x} dx$$

$$274) \int \frac{1}{\cos^3 x \sec x} dx$$

$$275) \int \tan^3 x \cdot \sec^3 x dx$$

$$276) \int \frac{\cos x}{\sec x + \cos x} dx$$

$$277) \int \frac{\cos x}{2 \sec x \cos^2 x + \sec^3 x} dx$$

$$278) \int \frac{1 + \sqrt{x+1}}{1 + \sqrt[3]{x+1}} dx$$

$$279) \int \frac{1+x+\sqrt{x+1}}{(x+1)\sqrt[3]{x+1}} dx$$

$$280) \int \frac{1}{(1-e^x)^2} dx$$

$$281) \int \frac{1 + \sqrt{e^x}}{(1 - \sqrt[4]{e^x})^2} dx$$

$$282) \int \frac{1}{e^x + e^{-x} + 1} dx$$

$$283) \int \frac{e^{3x}}{e^{2x} - 3e^x + 2} dx$$

$$284) \int (1-x^2)^{-3/2} dx$$

$$285) \int (1-(2x+1)^2)^{-1/2} dx$$

$$286) \int \frac{2^{3x}}{2^x - 4} dx$$

$$287) \int \frac{\sec(2x) + \cos x}{\cos x} dx$$

$$288) \int \frac{7}{x^3 \sqrt{\ln x}} dx$$

$$289) \int \frac{(\ln x)^2 + x}{x} dx$$

$$290) \int \frac{1}{\sqrt{x+2} + \sqrt{x-2}} dx$$

$$291) \int \frac{\sqrt{1+x^2} + \sqrt{1-x^2}}{\sqrt{1-x^4}} dx$$

$$292) \int \frac{x-1}{\sqrt{2x} - \sqrt{x+1}} dx$$

$$293) \int e^{2x} \cdot \sec(e^x) dx$$

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

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

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

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

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

$$6) \int (4x^3 - 7x^2 + 5x + 1) dx = \frac{4x^4}{4} - \frac{7x^3}{3} + \frac{5x^2}{2} + x + C = x^4 - \frac{7x^3}{3} + \frac{5x^2}{2} + x + C$$

$$7) \int \sqrt[5]{x^2} dx = \int x^{2/5} dx = \frac{x^{7/5}}{7/5} + C = \frac{5}{7} \sqrt[5]{x^7} + C$$

$$8) \int \sqrt[3]{x} dx = \int x^{1/3} dx = \frac{x^{4/3}}{4/3} + C = \frac{3}{4} \sqrt[3]{x^4} + C$$

$$9) \int \frac{dx}{\sqrt[7]{x^6}} = \int x^{-6/7} dx = \frac{x^{1/7}}{1/7} = 7 \sqrt[7]{x} + C$$

$$10) \int \frac{dx}{\sqrt[7]{x^5}} = \int x^{-5/7} dx = \frac{x^{2/7}}{2/7} + C = \frac{7}{2} \sqrt[7]{x^2} + C$$

$$11) \int \frac{2}{x} dx = 2 \int \frac{1}{x} dx = 2 \ln|x| + C$$

$$12) \int (x-1)(x^2+x+1) dx = \int (x^3 + \cancel{x^2} + \cancel{x} - \cancel{x^2} - \cancel{x} - 1) dx = \int (x^3 - 1) dx = \\ = \frac{x^4}{4} - x + C$$

$$13) \int (x^2+4x)(x^2-1) dx = \int (x^4 - x^2 + 4x^3 - 4x) dx = \\ = \frac{x^5}{5} - \frac{x^3}{3} + \frac{4x^4}{4} - \frac{4x^2}{2} + C = \frac{x^5}{5} - \frac{x^3}{3} + x^4 - 2x^2 + C$$

$$14) \int (x^3 - 3x^4 + 5x^2 - 1) dx = \frac{x^4}{4} - \frac{3x^5}{5} + \frac{5x^3}{3} - x + C$$

$$15) \int (x^7 - 3x) dx = \frac{x^8}{8} - \frac{3x^2}{2} + C$$

$$16) \int (4x^2 - 5x + 7) dx = \frac{4x^3}{3} - \frac{5x^2}{2} + 7x + C$$

$$17) \int (x - \sec x) dx = \frac{x^2}{2} + \cos x + C$$

$$18) \int (x + \cos x) dx = \frac{x^2}{2} + \sec x + C$$

$$19) \int (x - 2 \operatorname{tg} x) dx = \frac{x^2}{2} + 2 \int \frac{-\sec x}{\cos x} dx = \frac{x^2}{2} + 2 \ln|\cos x| + C$$

$$20) \int (\sec x + e^x) dx = -\cos x + e^x + C$$

$$21) \int (\cos x - 5e^x) dx = \sin x - 5e^x + C$$

$$22) \int (e^x - e^{-x}) dx = \int e^x dx + \int -e^{-x} dx = e^x + e^{-x} + C$$

$$23) \int (e^x + 3e^{-x}) dx = e^x - 3e^{-x} + C$$

$$24) \int \frac{3}{x-5} dx = 3 \int \frac{1}{x-5} dx = 3 \ln|x-5| + C$$

$$25) \int \frac{1}{2x-7} dx = \frac{1}{2} \int \frac{2}{2x-7} dx = \frac{1}{2} \ln|2x-7| + C$$

$$26) \int \frac{3}{1+x^2} dx = 3 \int \frac{1}{1+x^2} dx = 3 \operatorname{arctg} x + C$$

$$27) \int \frac{2}{1+4x^2} dx = \int \frac{2}{1+(2x)^2} dx = \operatorname{arctg}(2x) + C$$

$$28) \int (2^x - x^2) dx = \frac{2^x}{\ln 2} - \frac{x^3}{3} + C$$

$$29) \int e^{x+2} dx = e^{x+2} + C$$

$$\begin{aligned} 30) \int \sqrt{x} \sqrt{x} dx &= \int \sqrt{x} \cdot \sqrt{x} dx = \int x^{1/2} \cdot x^{1/4} dx = \int x^{3/4} dx = \\ &= \frac{x^{7/4}}{7/4} = \frac{4}{7} \cdot \sqrt[4]{x^7} + C \end{aligned}$$

$$31) \int \frac{1}{3-x} dx = - \int \frac{-1}{3-x} dx = - \ln |3-x| + C$$

$$32) \int \frac{2x}{\sqrt{1-x^2}} dx = - \int -2x \cdot (1-x^2)^{-1/2} dx = - \frac{(1-x^2)^{1/2}}{1/2} + C =$$
$$= -2 \sqrt{1-x^2} + C$$

$$33) \int \frac{\cos x}{\operatorname{sen} x} dx = \ln |\operatorname{sen} x| + C$$

$$34) \int \operatorname{tg} x dx = - \int \frac{-\operatorname{sen} x}{\cos x} dx = - \ln |\cos x| + C$$

$$35) \int \frac{1}{1+x} dx = \ln |1+x| + C$$

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

$$37) \int \frac{2x}{1+x^4} dx = \int \frac{2x}{1+(x^2)^2} dx = \operatorname{arctg} (x^2) + C$$

$$38) \int \frac{1}{x-4} dx = \ln |x-4| + C$$

$$39) \int \cos(-x) dx = - \int -\cos(-x) dx = - \operatorname{sen}(-x) + C$$

$$40) \int \operatorname{sen}(2x+1) dx = \frac{1}{2} \int 2 \operatorname{sen}(2x+1) dx = -\frac{1}{2} \cos(2x+1) + C$$

$$41) \int \operatorname{sen}(2-3x) dx = \frac{-1}{3} \int -3 \operatorname{sen}(2-3x) dx = \frac{1}{3} \cos(2-3x) + C$$

$$42) \int \cos\left(\frac{2x+1}{3}\right) dx = \frac{3}{2} \int \frac{2}{3} \cos\left(\frac{2x+1}{3}\right) dx = \frac{3}{2} \operatorname{sen}\left(\frac{2x+1}{3}\right) + C$$

$$43) \int \frac{-3x}{2-6x^2} dx = \frac{1}{4} \int \frac{4 \cdot (-3x)}{2-6x^2} dx = \frac{1}{4} \ln|2-6x^2| + C$$

$$44) \int \frac{5}{\cos^2 x} dx = 5 \int \frac{1}{\cos^2 x} dx = 5 \operatorname{tg} x + C$$

$$45) \int \frac{3}{\sqrt{1-x^2}} dx = 3 \int \frac{1}{\sqrt{1-x^2}} dx = 3 \operatorname{arcsen}(x) + C$$

$$46) \int \frac{2}{\sqrt{1-4x^2}} dx = \int \frac{2 dx}{\sqrt{1-(2x)^2}} = \operatorname{arcsen}(2x) + C$$

$$47) \int \frac{2x-5}{x^2-5x+6} dx = \ln|x^2-5x+6| + C$$

$$48) \int \operatorname{sen} x \cdot (\cos x)^4 dx = - \int -\operatorname{sen} x \cdot (\cos x)^4 dx = -\frac{(\cos x)^5}{5} + C$$

$$49) \int \operatorname{sen}\left(\frac{x}{2}\right) dx = 2 \int \frac{1}{2} \operatorname{sen}\left(\frac{x}{2}\right) dx = -2 \cos\left(\frac{x}{2}\right) + C$$

$$50) \int \frac{-3x^3}{1+x^4} dx = \frac{-3}{4} \int \frac{4x^3}{1+x^4} dx = -\frac{3}{4} \ln|1+x^4| + C$$

$$51) \int \frac{x^2}{1+x^3} dx = \frac{1}{3} \int \frac{3x^2}{1+x^3} dx = \frac{1}{3} \ln |1+x^3| + C$$

$$52) \int \frac{1}{(x+2)^3} dx = \int (x+2)^{-3} dx = \frac{(x+2)^{-2}}{-2} = \frac{-1}{2(x+2)^2} + C$$

$$53) \int \cotg x dx = \int \frac{\cos x}{\operatorname{sen} x} dx = \ln |\operatorname{sen} x| + C$$

$$54) \int e^{7x} dx = \frac{1}{7} \int 7 e^{7x} dx = \frac{1}{7} e^{7x} + C$$

$$55) \int e^{-2x+3} dx = -\frac{1}{2} \int -2 e^{-2x+3} dx = -\frac{1}{2} e^{-2x+3} + C$$

$$56) \int x \cdot e^{x^2} dx = \frac{1}{2} \int 2x e^{x^2} dx = \frac{1}{2} e^{x^2} + C$$

$$57) \int x^2 \cdot e^{x^3} dx = \frac{1}{3} \int 3x^2 \cdot e^{x^3} dx = \frac{1}{3} e^{x^3} + C$$

$$58) \int \cos(3x) dx = \frac{1}{3} \int 3 \cos(3x) dx = \frac{1}{3} \operatorname{sen}(3x) + C$$

$$59) \int x \operatorname{sen}(x^2+4) dx = \frac{1}{2} \int 2x \operatorname{sen}(x^2+4) dx = -\frac{1}{2} \cos(x^2+4) + C$$

$$60) \int \frac{2x}{1+x^4} dx = \int \frac{2x}{1+(x^2)^2} dx = \operatorname{arctg}(x^2) + C$$

$$61) \int \frac{2x^3}{1+x^4} dx = \frac{1}{2} \int \frac{2 \cdot 2x^3}{1+x^4} dx = \frac{1}{2} \ln |1+x^4| + C$$

$$62) \int \frac{e^x}{1+e^{2x}} dx = \int \frac{e^x}{1+(e^x)^2} dx = \operatorname{arctg}(e^x) + C$$

$$63) \int \frac{dx}{\sqrt{9-x^2}} = \int \frac{dx}{\sqrt{\overset{9}{\underset{9}{(9-x^2)}}}} = \frac{1}{3} \int \frac{dx}{\sqrt{1-\frac{x^2}{9}}} = \left(\frac{1}{3}\right) \int \frac{dx}{\sqrt{1-\left(\frac{x}{3}\right)^2}} =$$

$$= \int \frac{\frac{1}{3} dx}{\sqrt{1-\left(\frac{x}{3}\right)^2}} = \operatorname{arcsen}\left(\frac{x}{3}\right) + C$$

$$64) \int \frac{dx}{1+4x^2} = \frac{1}{2} \int \frac{2 dx}{1+(2x)^2} = \frac{1}{2} \operatorname{arctg}(2x) + C$$

$$65) \int \frac{x dx}{\sqrt{1-4x^2}} = \frac{-1}{8} \int -8x \cdot (1-4x^2)^{-\frac{1}{2}} dx = -\frac{1}{8} \cdot \frac{(1-4x^2)^{\frac{1}{2}}}{\frac{1}{2}} + C =$$

$$= -\frac{1}{4} \cdot \sqrt{1-4x^2} + C$$

$$66) \int \frac{1}{\cos^2(3x)} dx = \frac{1}{3} \int \frac{3}{\cos^2(3x)} dx = \frac{1}{3} \operatorname{tg}(3x) + C$$

$$67) \int \frac{1+\cos x}{x+\operatorname{sen} x} dx = \ln|x+\operatorname{sen} x| + C$$

$$68) \int \frac{5e^x}{1+e^{2x}} dx = 5 \int \frac{e^x}{1+(e^x)^2} dx = 5 \operatorname{arctg}(e^x) + C$$

$$69) \int 5x \cdot e^{3x^2+3} dx = \frac{5}{6} \int 6x \cdot e^{3x^2+3} dx = \frac{5}{6} e^{3x^2+3} + C$$

$$70) \int \frac{\operatorname{arcsen} x}{u} \frac{dx}{dv} = x \cdot \operatorname{arcsen} x - \int \frac{x}{\sqrt{1-x^2}} dx = \textcircled{*}$$

$$u = \operatorname{arcsen} x \quad du = \frac{1}{\sqrt{1-x^2}} dx$$

$$dv = dx \quad v = x$$

$$\textcircled{*} = x \operatorname{arcsen} x + \frac{1}{2} \int -2x (1-x^2)^{-1/2} dx =$$

$$= x \operatorname{arcsen} x + \frac{1}{2} \frac{(1-x^2)^{1/2}}{-1/2} = x \operatorname{arcsen} x + \sqrt{1-x^2} + C$$

$$71) \int \frac{\arccos x}{u} \frac{dx}{dv} = x \arccos x + \int \frac{x}{\sqrt{1-x^2}} dx = \textcircled{*}$$

$$u = \arccos x \quad du = \frac{-1}{\sqrt{1-x^2}} dx$$

$$dv = dx \quad v = x$$

$$\textcircled{*} = x \arccos x + \frac{-1}{2} \int -2x (1-x^2)^{-1/2} dx =$$

$$= x \arccos x - \frac{1}{2} \frac{(1-x^2)^{1/2}}{-1/2} = x \arccos x - \sqrt{1-x^2} + C$$

$$72) \int \underbrace{\arctg x}_u \frac{dx}{dv} = x \arctg x - \frac{1}{2} \int \frac{2x}{1+x^2} dx =$$

$$u = \arctg x \quad du = \frac{1}{1+x^2} dx \quad \Bigg\| \quad = x \arctg x - \frac{1}{2} \ln |1+x^2| + C$$

$$dv = dx \quad v = x$$

$$73) \int \underbrace{x}_u \frac{\sin x dx}{dv} = -x \cos x + \int \cos x dx = -x \cos x + \sin x + C$$

$$u = x \quad du = dx$$

$$dv = \sin x dx \quad v = -\cos x$$

$$74) \int \underbrace{x}_u \cdot \frac{\cos x dx}{dv} = x \sin x - \int \sin x dx = x \sin x + \cos x + C$$

$$u = x \quad du = 1 dx$$

$$dv = \cos x dx \quad v = \sin x$$

$$75) \int \underbrace{x^2}_u \cdot \frac{\cos x dx}{dv} = x^2 \sin x - \int \underbrace{2x}_u \frac{\sin x dx}{dv} = \textcircled{*}$$

$$u = x^2 \quad du = 2x dx \quad \Bigg\| \quad u = 2x \quad du = 2 dx$$

$$dv = \cos x dx \quad v = \sin x \quad \Bigg\| \quad dv = \sin x dx \quad v = -\cos x$$

$$\textcircled{*} = x^2 \sin x - \left[-2x \cos x + \int 2 \cos x dx \right] =$$

$$= x^2 \sin x + 2x \cos x - 2 \sin x + C$$

$$76) \int \underbrace{x^2}_u \cdot \frac{dx}{dv} = -x^2 \cos x + \int \underbrace{2x}_u \frac{\cos x dx}{dv} = \textcircled{*}$$

$$u = x^2 \quad du = 2x dx \quad \parallel \quad u = 2x \quad du = 2 dx$$

$$dv = \sin x dx \quad v = -\cos x \quad \parallel \quad dv = \cos x dx \quad v = \sin x$$

$$\textcircled{*} = -x^2 \cos x + 2x \sin x - \int 2 \sin x dx =$$

$$= -x^2 \cos x + 2x \sin x + 2 \cos x + C$$

$$77) \int \underbrace{x}_u \cdot \frac{e^x dx}{dv} = x e^x - \int 1 e^x dx = x e^x - e^x + C$$

$$u = x \quad du = 1 dx$$

$$dv = e^x dx \quad v = e^x$$

$$78) \int \underbrace{x^2}_u \cdot \frac{e^x dx}{dv} = x^2 \cdot e^x - \int \underbrace{2x}_u \frac{e^x dx}{dv} = \textcircled{*}$$

$$u = x^2 \quad du = 2x dx \quad \parallel \quad u = 2x \quad du = 2 dx$$

$$dv = e^x dx \quad v = e^x \quad \parallel \quad dv = e^x dx \quad v = e^x$$

$$\textcircled{*} = x^2 \cdot e^x - \left[2x e^x - \int 2 e^x dx \right] = x^2 e^x - 2x e^x + 2 e^x + C$$

$$79) \int \underbrace{x^3}_u \cdot \frac{e^x dx}{dv} = x^3 \cdot e^x - \int \underbrace{3x^2}_u \cdot \frac{e^x dx}{dv} = x^3 \cdot e^x - \left[3x^2 e^x - \int \underbrace{6x}_u \frac{e^x dx}{dv} \right] = \textcircled{*}$$

$$u = x^3 \quad du = 3x^2 dx \quad \parallel \quad u = 3x^2 \quad du = 6x dx \quad \parallel \quad u = 6x \quad du = 6 dx$$

$$dv = e^x dx \quad v = e^x \quad \parallel \quad dv = e^x dx \quad v = e^x \quad \parallel \quad dv = e^x dx \quad v = e^x$$

$$\textcircled{*} = x^3 \cdot e^x - 3x^2 e^x + 6x e^x - \int 6 e^x dx = x^3 e^x - 3x^2 e^x + 6x e^x - 6 e^x + C$$

$$80) \int \underbrace{e^x}_{u} \underbrace{\sin x dx}_{dv} = -e^x \cos x + \int \frac{e^x \cos x}{u} = \textcircled{*}$$

$$u = e^x \quad du = e^x dx \quad \Bigg| \quad u = e^x \quad du = e^x dx$$

$$dv = \sin x dx \quad v = -\cos x \quad \Bigg| \quad dv = \cos x dx \quad v = \sin x$$

$$\textcircled{*} = -e^x \cos x + e^x \sin x - \int e^x \sin x dx = I$$

$$\Rightarrow I = -e^x \cos x + e^x \sin x - I \Rightarrow$$

$$\Rightarrow 2I = -e^x \cos x + e^x \sin x$$

$$\Rightarrow I = \frac{-e^x \cos x + e^x \sin x}{2} + C$$

$$81) \int \underbrace{e^x}_{u} \underbrace{\cos x dx}_{dv} = e^x \sin x - \int \frac{e^x \sin x}{u} = \textcircled{*}$$

$$u = e^x \quad du = e^x dx \quad \Bigg| \quad u = e^x \quad du = e^x dx$$

$$dv = \cos x dx \quad v = \sin x \quad \Bigg| \quad dv = \sin x dx \quad v = -\cos x$$

$$\textcircled{*} = e^x \sin x - [-e^x \cos x + \int e^x \cos x dx] = e^x \sin x + e^x \cos x - \int e^x \cos x dx = I$$

$$\Rightarrow I = e^x \sin x + e^x \cos x - I \Rightarrow$$

$$\Rightarrow 2I = e^x \sin x + e^x \cos x$$

$$\Rightarrow I = \frac{e^x \sin x + e^x \cos x}{2} + C$$

$$82) \int \frac{\ln x \, dx}{x} = x \ln x - \int 1 \, dx = x \ln x - x + C$$

$$u = \ln x \quad du = \frac{1}{x} \, dx$$

$$dv = dx \quad v = x$$

$$83) \int x \frac{\ln x \, dx}{x^2} = \frac{x^2}{2} \ln x - \int \frac{x}{2} \, dx = \frac{x^2}{2} \ln x - \frac{x^2}{4} + C$$

$$u = \ln x \quad du = \frac{1}{x} \, dx$$

$$dv = x \, dx \quad v = \frac{x^2}{2}$$

$$84) \int (x^2 - 7x + 12) \, dx = \frac{x^3}{3} - \frac{7x^2}{2} + 12x + C$$

$$85) \int (x^3 - 12x^2 + 14x - 5) \, dx = \frac{x^4}{4} - \frac{12x^3}{3} + \frac{14x^2}{2} - 5x = \\ = \frac{x^4}{4} - 4x^3 + 7x^2 - 5x + C$$

$$86) \int (x^5 - 7 + \frac{4}{x^2}) \, dx = \frac{x^6}{6} - 7x + 4 \int x^{-2} \, dx = \frac{x^6}{6} - 7x + \frac{4x^{-1}}{-1} = \\ = \frac{x^6}{6} - 7x - \frac{4}{x} + C$$

$$87) \int (6x^2 - \frac{6}{x} + \frac{8}{x^3}) \, dx = \frac{6x^3}{3} - 6 \ln|x| + \frac{8x^{-2}}{-2} + C = \\ = 2x^3 - 6 \ln|x| - \frac{4}{x^2} + C$$

$$88) \int \frac{x^3 - 7x^2 + 4}{x} dx = \int \left(x^2 - 7x + \frac{4}{x}\right) dx = \frac{x^3}{3} - \frac{7x^2}{2} + 4 \ln|x| + C$$

$$89) \int \frac{x^3 - 5x + 3}{x} dx = \int \left(x^2 - 5 + \frac{3}{x}\right) dx = \frac{x^3}{3} - 5x + 3 \ln|x| + C$$

$$90) \int (x^2 - 5)^2 dx = \int (x^4 - 10x^2 + 25) dx = \frac{x^5}{5} - \frac{10x^3}{3} + 25x + C$$

$$91) \int (x+4)^3 dx = \frac{(x+4)^4}{4} + C$$

$$92) \int \frac{x^3 - 5x + 3}{x-2} dx = \int (x^2 + 2x - 1) dx + \int \frac{1}{x-2} dx =$$

$$\begin{array}{r} x^3 + 0x^2 - 5x + 3 \quad | \quad x-2 \\ -x^3 + 2x^2 \\ \hline 2x^2 - 5x + 3 \\ -2x^2 + 4x \\ \hline -x + 3 \\ +x - 2 \\ \hline 1 \end{array}$$

$$= \frac{x^3}{3} + \frac{2x^2}{2} - x + \ln|x-2| + C$$

$$\begin{aligned} 93) \int \frac{\sqrt{3x^3}}{\sqrt[3]{x^2}} dx &= \int \frac{\sqrt{3} \cdot \sqrt{x^3}}{\sqrt[3]{x^2}} dx = \sqrt{3} \int \frac{x^{3/2}}{x^{2/3}} dx = \sqrt{3} \int x^{5/6} dx = \\ &= \sqrt{3} \cdot \frac{x^{11/6}}{11/6} + C = \frac{6\sqrt{3}}{11} \cdot \sqrt[6]{x^{11}} + C \end{aligned}$$

$$\begin{aligned}
 94) \int \frac{\sqrt{3x^3}}{\sqrt[3]{5x^2}} dx &= \int \frac{\sqrt{3} \sqrt{x^3}}{\sqrt[3]{5} \cdot \sqrt[3]{x^2}} dx = \frac{\sqrt{3}}{\sqrt[3]{5}} \cdot \int \frac{x^{3/2}}{x^{2/3}} dx = \\
 &= \frac{\sqrt{3}}{\sqrt[3]{5}} \cdot \int x^{5/6} dx = \frac{\sqrt{3}}{\sqrt[3]{5}} \cdot \frac{x^{11/6}}{11/6} + C = \frac{6\sqrt{3}}{\sqrt[3]{5}} \cdot \sqrt[6]{x^{11}} + C
 \end{aligned}$$

$$\begin{aligned}
 95) \int \frac{\sqrt{3x-5}}{\sqrt[3]{2x}} dx &= \int \frac{\sqrt{3x}}{\sqrt[3]{2x}} dx - \int \frac{5}{\sqrt[3]{2x}} dx = \\
 &= \int \frac{\sqrt{3} \cdot \sqrt{x}}{\sqrt[3]{2} \cdot \sqrt[3]{x}} dx - 5 \int \frac{1}{\sqrt[3]{2} \cdot \sqrt[3]{x}} dx = \\
 &= \frac{\sqrt{3}}{\sqrt[3]{2}} \int \frac{x^{1/2}}{x^{1/3}} dx - \frac{5}{\sqrt[3]{2}} \int x^{-1/3} dx = \frac{\sqrt{3}}{\sqrt[3]{2}} \int x^{1/6} dx - \frac{5}{\sqrt[3]{2}} \int x^{-1/3} dx \\
 &= \frac{\sqrt{3}}{\sqrt[3]{2}} \frac{x^{7/6}}{7/6} - \frac{5}{\sqrt[3]{2}} \frac{x^{2/3}}{2/3} + C = \frac{6\sqrt{3}}{7\sqrt[3]{2}} \cdot \sqrt[6]{x^7} - \frac{15}{2\sqrt[3]{2}} \cdot \sqrt[3]{x^2} + C
 \end{aligned}$$

$$\begin{aligned}
 96) \int \frac{(x^2-1)^2}{\sqrt{x}} dx &= \int \frac{x^4 - 2x^2 + 1}{\sqrt{x}} dx = \int \frac{x^4}{x^{1/2}} dx - 2 \int \frac{x^2}{x^{1/2}} dx + \int x^{-1/2} dx \\
 &= \int x^{7/2} dx - 2 \int x^{3/2} dx + \int x^{-1/2} dx = \\
 &= \frac{x^{9/2}}{9/2} - 2 \cdot \frac{x^{5/2}}{5/2} + \frac{x^{1/2}}{1/2} + C = \frac{2}{9} \sqrt{x^9} - \frac{4}{5} \sqrt{x^5} + 2\sqrt{x} + C
 \end{aligned}$$

$$97) \int (2x+3)^3 \cdot \sqrt{x} dx = \int (8x^3 + 36x^2 + 54x + 27) \cdot \sqrt{x} dx = \textcircled{A}$$

$$\begin{array}{c} 1 \\ 1 \ 2 \ 1 \\ 1 \ 3 \ 3 \ 1 \end{array} (2x+3)^3 = (2x)^3 + 3 \cdot (2x)^2 \cdot 3 + 3 \cdot (2x) \cdot 3^2 + 3^3 =$$

$$= 8x^3 + 36x^2 + 54x + 27$$

$$\textcircled{A} = 8 \int x^3 \cdot x^{1/2} dx + 36 \int x^2 \cdot x^{1/2} dx + 54 \int x \cdot x^{1/2} dx + 27 \int x^{1/2} dx =$$

$$= 8 \cdot \int x^{7/2} dx + 36 \int x^{5/2} dx + 54 \int x^{3/2} dx + 27 \int x^{1/2} dx =$$

$$= 8 \cdot \frac{x^{9/2}}{9/2} + 36 \frac{x^{7/2}}{7/2} + 54 \frac{x^{5/2}}{5/2} + 27 \frac{x^{3/2}}{3/2} + C =$$

$$= \frac{16}{9} \sqrt{x^9} + \frac{72}{7} \sqrt{x^7} + \frac{108}{5} \sqrt{x^5} + 18 \sqrt{x^3} + C$$

$$98) \int (\sqrt[3]{x^2} - 3\sqrt{x} + 12) dx = \int x^{2/3} dx - 3 \int x^{1/2} dx + \int 12 dx =$$

$$= \frac{x^{5/3}}{5/3} - 3 \frac{x^{3/2}}{3/2} + 12x + C = \frac{3}{5} \sqrt[3]{x^5} - 2 \sqrt{x^3} + 12x + C$$

$$99) \int \frac{3x+2}{\sqrt{x}} dx = \int \frac{3x}{x^{1/2}} dx + \int \frac{2}{x^{1/2}} dx = 3 \int x^{1/2} dx + 2 \int x^{-1/2} dx$$

$$= \frac{3x^{3/2}}{3/2} + 2 \frac{x^{1/2}}{1/2} + C = 2\sqrt{x^3} + 4\sqrt{x} + C$$

$$100) \int 5x \sqrt{x^2+7} dx = \frac{5}{2} \int 2x (x^2+7)^{1/2} dx = \frac{5}{2} \frac{(x^2+7)^{3/2}}{3/2} + C =$$

$$= \frac{5}{3} \sqrt{(x^2+7)^3} + C$$

$$101) \int x^3 \sqrt[3]{x-12} dx = \int (t^3+12)^3 \cdot \sqrt[3]{t^3} \cdot 3t^2 dt = (*)$$

$$x-12 = t^3 \rightarrow x = t^3+12$$

$$dx = 3t^2 dt$$

$$(*) = \int 3t^2 \cdot t \cdot (t^3+12)^3 dt = \int 3t^3 \cdot (t^3+12)^3 dt = (**)$$

$$\begin{array}{c} 1 & 1 & 1 & 1 \\ 1 & 2 & 1 & \\ 1 & 3 & 3 & 1 \end{array} \quad (t^3+12)^3 = (t^3)^3 + 3 \cdot (t^3)^2 \cdot 12 + 3 \cdot (t^3) \cdot 12^2 + 12^3 =$$

$$= t^9 + 36t^6 + 432t^3 + 1728$$

$$(**) = \int 3t^3 \cdot (t^9 + 36t^6 + 432t^3 + 1728) dt =$$

$$= \int (3t^{12} + 108t^9 + 1296t^6 + 5184t^3) dt =$$

$$= \frac{3t^{13}}{13} + \frac{108t^{10}}{10} + \frac{1296t^7}{7} + \frac{5184t^4}{4} + C'$$

$$= \frac{3}{13} \sqrt[3]{(x-12)^{13}} + \frac{108}{10} \sqrt[3]{(x-12)^{10}} + \frac{1296}{7} \sqrt[3]{(x-12)^7} + 1296 \sqrt[3]{(x-12)^4} + C$$

$$102) \int x (2x^2-7)^{99} dx = \frac{1}{t} \int 4x (2x^2-7)^{99} dx = \frac{1}{4} \frac{(2x^2-7)^{100}}{100} + C$$

$$103) \int \frac{4x dx}{\sqrt[3]{8-x^2}} = \frac{4}{-2} \int -2x (8-x^2)^{-1/3} dx = -2 \frac{(8-x^2)^{2/3}}{2/3} + C =$$

$$= -3 \sqrt[3]{(8-x^2)^2} + C$$

$$104) \int x (3x^2 - 1)^{240} dx = \frac{1}{6} \int 6x (3x^2 - 1)^{240} dx =$$

$$= \frac{1}{6} \frac{(3x^2 - 1)^{241}}{241} + C$$

$$105) \int (2 - 7x)^{2/3} dx = -\frac{1}{7} \int -7 (2 - 7x)^{2/3} dx = -\frac{1}{7} \frac{(2 - 7x)^{5/3}}{5/3} + C =$$

$$= -\frac{3}{35} \sqrt[3]{(2 - 7x)^5} + C$$

$$106) \int \frac{dx}{(3x + 1)^5} = \frac{1}{3} \int 3 (3x + 1)^{-5} dx = \frac{1}{3} \frac{(3x + 1)^{-4}}{-4} + C =$$

$$= -\frac{1}{12} \cdot \frac{1}{(3x + 1)^4} + C$$

$$107) \int x \cdot \sqrt{2x^2 + 17} dx = \frac{1}{4} \int 4x (2x^2 + 17)^{1/2} dx = \frac{1}{4} \frac{(2x^2 + 17)^{3/2}}{3/2} + C =$$

$$= \frac{1}{6} \sqrt{(2x^2 + 17)^3} + C$$

$$108) \int \frac{x+1}{\sqrt[3]{x^2+2x+12}} dx = \frac{1}{2} \int 2(x+1) \cdot (x^2+2x+12)^{-1/3} dx =$$

$$= \frac{1}{2} \frac{(x^2+2x+12)^{2/3}}{2/3} + C = \frac{3}{4} \cdot \sqrt[3]{(x^2+2x+12)^2} + C$$

$$109) \int \sqrt{x^2 - 2x + 3} \cdot (x - 1) dx = \frac{1}{2} \int 2(x - 1) \cdot (x^2 - 2x + 3)^{1/2} dx =$$

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

$$110) \int \cos(5x) dx = \frac{1}{5} \int 5 \cos(5x) dx = \frac{1}{5} \operatorname{sen}(5x) + C$$

$$111) \int \operatorname{sen}(2x) \cdot \cos(2x) dx = \frac{1}{2} \int 2 \cos(2x) \cdot \operatorname{sen}(2x) dx = \\ = \frac{1}{2} \cdot \frac{(\operatorname{sen} 2x)^2}{2} + C$$

$$112) \int e^{\operatorname{sen} x} \cdot \cos x dx = e^{\operatorname{sen} x} + C$$

$$113) \int e^{-5x} dx = -\frac{1}{5} \int -5 e^{-5x} dx = -\frac{1}{5} e^{-5x} + C$$

$$114) \int \frac{e^{-2x} \cdot e^{2x}}{2} dx = \int \frac{e^0}{2} dx = \int \frac{1}{2} dx = \frac{1}{2} x + C$$

$$115) \int \operatorname{sen}^2\left(\frac{x}{2}\right) \cdot \cos\left(\frac{x}{2}\right) dx = 2 \int \frac{1}{2} \cos\left(\frac{x}{2}\right) \cdot \left[\operatorname{sen}\left(\frac{x}{2}\right)\right]^2 dx = \\ = 2 \cdot \frac{(\operatorname{sen}\left(\frac{x}{2}\right))^3}{3} + C$$

$$116) \int \operatorname{tg} x \cdot \sec^2 x dx = \int \underbrace{\sec(x)}_{F(x)} \cdot \underbrace{\sec(x) \cdot \operatorname{tg}(x)}_{F'(x)} dx = \frac{\sec^2(x)}{2} + C$$

$$117) \int \operatorname{sen}^2(4x) dx = \int \frac{\operatorname{sen}(4x)}{u} \frac{\operatorname{sen}(4x)}{dv} dx = (*)$$

$$u = \operatorname{sen}(4x) \quad du = 4 \cos(4x) dx$$

$$dv = \operatorname{sen}(4x) \quad v = -\frac{1}{4} \cos(4x)$$

$$\begin{aligned}
 \textcircled{*} &= -\frac{1}{4} \cos(4x) \operatorname{sen}(4x) + \int \cos^2(4x) dx = \\
 &= -\frac{1}{4} \cos(4x) \operatorname{sen}(4x) + \int (1 - \operatorname{sen}^2(4x)) dx = \\
 &= -\frac{1}{4} \cos(4x) \operatorname{sen}(4x) + x - \int \operatorname{sen}^2(4x) dx \stackrel{=I}{=}
 \end{aligned}$$

$$\Rightarrow I = -\frac{1}{4} \cos(4x) \operatorname{sen}(4x) + x - I \Rightarrow$$

$$\Rightarrow 2I = -\frac{1}{4} \cos(4x) \operatorname{sen}(4x) + x$$

$$\Rightarrow I = \frac{-\frac{1}{4} \cos(4x) \operatorname{sen}(4x) + x}{2} + C$$

$$118) \int \cos^3(3x) dx = \int \cos(3x) \cdot \cos^2(3x) dx =$$

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

$$= \frac{1}{3} \operatorname{sen}(3x) - \frac{1}{3} \frac{\operatorname{sen}^3(3x)}{3} + C$$

$$119) \int \cos^5 x dx = \int \cos^3 x \cdot \cos^2 x dx = \int \cos^3 x \cdot (1 - \operatorname{sen}^2 x) dx =$$

$$= \underbrace{\int \cos^3 x dx}_{I_1} - \underbrace{\int \cos^3 x \cdot \operatorname{sen}^2 x dx}_{I_2}$$

$$\begin{aligned}
 I_1 &\rightarrow \int \cos^3 x \, dx = \int \cos x \cdot \cos^2 x \, dx = \int \cos x (1 - \operatorname{sen}^2 x) \, dx = \\
 &= \int \cos x \, dx - \int \cos x \operatorname{sen}^2 x \, dx = \operatorname{sen} x - \frac{\operatorname{sen}^3 x}{3} + C_1
 \end{aligned}$$

$$\begin{aligned}
 I_2 &\rightarrow \int \cos^3 x \cdot \operatorname{sen}^2 x \, dx = \int \cos x \cdot \cos^2 x \operatorname{sen}^2 x \, dx = \\
 &= \int \cos x (1 - \operatorname{sen}^2 x) \operatorname{sen}^2 x \, dx = \int \cos x \operatorname{sen}^2 x \, dx - \int \cos x \operatorname{sen}^4 x \, dx \\
 &= \frac{\operatorname{sen}^3 x}{3} - \frac{\operatorname{sen}^5 x}{5} + C_2
 \end{aligned}$$

$$\begin{aligned}
 \Rightarrow I &= I_1 - I_2 = \operatorname{sen} x - \frac{\operatorname{sen}^3 x}{3} - \left(\frac{\operatorname{sen}^3 x}{3} - \frac{\operatorname{sen}^5 x}{5} \right) + C = \\
 &= \operatorname{sen} x - \frac{2\operatorname{sen}^3 x}{3} + \frac{\operatorname{sen}^5 x}{5} + C
 \end{aligned}$$

$$120) \int \frac{x^2 - 4}{x - 3} \, dx = \int (x + 3) \, dx + \int \frac{5}{x - 3} \, dx =$$

$$\begin{array}{r}
 x^2 + 0x - 4 \quad | \quad x - 3 \\
 -x^2 + 3x \quad \quad | \quad x + 3 \\
 \hline
 3x - 4 \\
 -3x + 9 \\
 \hline
 5
 \end{array}$$

$$= \frac{x^2}{2} + 3x + 5 \ln |x - 3| + C$$

$$121) \int (2^x + x^2) dx = \frac{2^x}{\ln 2} - \frac{x^3}{3} + C$$

$$122) \int \frac{x^2}{x^3+2} dx = \frac{1}{3} \int \frac{3x^2}{x^3+2} dx = \frac{1}{3} \ln |x^3+2| + C$$

$$123) \int x^2 \cdot \operatorname{sen} x^3 dx = \frac{1}{3} \int 3x^2 \operatorname{sen} x^3 dx = -\frac{1}{3} \cos(x^3) + C$$

$$124) \int \frac{-3x}{1+x^4} dx = -\frac{3}{2} \int \frac{2x}{1+(x^2)^2} dx = -\frac{3}{2} \operatorname{arctg}(x^2) + C$$

$$125) \int \frac{2x}{4+x^4} dx = 2 \int \frac{1x dx}{(4+x^4)} = \frac{1}{2} \int \frac{x dx}{1 + \left(\frac{x^2}{2}\right)^2} =$$

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

$$126) \int x^3 dx = \frac{x^4}{4} + C$$

$$127) \int \frac{x^4}{3} dx = \frac{x^5}{15} + C$$

$$128) \int \frac{x^5}{6} dx = \frac{x^6}{36} + C$$

$$129) \int (x^2+3) dx = \frac{x^3}{3} + 3x + C$$

$$130) \int (x^3+2x - \frac{1}{x}) dx = \frac{x^4}{4} + x^2 - \ln|x| + C$$

$$131) \int \frac{x^4 - x^2 + 1}{x} dx = \int (x^3 - x + \frac{1}{x}) dx = \frac{x^4}{4} - \frac{x^2}{2} + \ln|x| + C$$

$$132) \int \frac{dx}{x^2} = \int x^{-2} dx = \frac{x^{-1}}{-1} + C = -\frac{1}{x} + C$$

$$133) \int \frac{1}{x^4} dx = \int x^{-4} dx = \frac{x^{-3}}{-3} + C = -\frac{1}{3x^3} + C$$

$$134) \int \frac{x^4 - 2x + 3}{x^7} dx = \int (x^{-3} - 2x^{-6} + 3x^{-7}) dx =$$

$$= \frac{x^{-2}}{-2} - 2 \frac{x^{-5}}{-5} + 3 \frac{x^{-6}}{-6} = -\frac{1}{2x^2} + \frac{2}{5x^5} - \frac{1}{2x^6} + C$$

$$135) \int \frac{x^5}{1+x} dx = \int (x^4 - x^3 + x^2 - x + 1) dx + \int \frac{-1}{x+1} dx = *$$

$$\begin{array}{r} x^5 + 0x^4 + 0x^3 + 0x^2 + 0x + 0 \\ -x^5 - x^4 \\ \hline \end{array} \quad \begin{array}{r} x+1 \\ x^4 - x^3 + x^2 - x + 1 \end{array}$$

$$\begin{array}{r} -x^4 + 0x^3 \\ +x^4 + x^3 \\ \hline \end{array}$$

$$\begin{array}{r} x^3 + 0x^2 \\ -x^3 - x^2 \\ \hline \end{array}$$

$$\begin{array}{r} -x^2 + 0x \\ +x^2 + x \\ \hline \end{array}$$

$$\begin{array}{r} x + 0 \\ -x - 1 \\ \hline \end{array}$$

$$-1$$

$$* = \frac{x^5}{5} - \frac{x^4}{4} + \frac{x^3}{3} - \frac{x^2}{2} + x - \ln|x+1| + C$$

$$136) \int \frac{\sqrt[3]{x}}{3} dx = \frac{1}{3} \int x^{1/3} dx = \frac{1}{3} \cdot \frac{x^{4/3}}{4/3} + C = \sqrt[3]{x^4} + C$$

$$137) \int \frac{dx}{\sqrt[5]{x}} = \int x^{-1/5} dx = \frac{x^{4/5}}{4/5} + C = \frac{5}{4} \sqrt[5]{x^4} + C$$

$$138) \int \left(\frac{8}{3} \sqrt[3]{x^5} + 6\sqrt{x} \right) dx = \frac{8}{3} \int x^{5/3} dx + 6 \int x^{1/2} dx =$$

$$= \frac{8}{3} \frac{x^{8/3}}{8/3} + 6 \cdot \frac{x^{3/2}}{3/2} + C = \sqrt[3]{x^8} + 4\sqrt{x^3} + C$$

$$139) \int \sqrt[3]{x} \cdot (\sqrt{x} + 3) dx = \int \sqrt[3]{x} \cdot \sqrt{x} dx + 3 \int \sqrt[3]{x} dx =$$

$$= \int x^{1/3} \cdot x^{1/2} dx + 3 \int x^{1/3} dx = \int x^{5/6} dx + 3 \int x^{1/3} dx =$$

$$= \frac{x^{11/6}}{11/6} + 3 \frac{x^{4/3}}{4/3} + C = \frac{6}{11} \sqrt[6]{x^{11}} + \frac{9}{4} \sqrt[3]{x^4} + C$$

$$140) \int (x - \sec x + 2 \cos x) dx = \frac{x^2}{2} + \cos x + 2 \sec x + C$$

$$141) \int \left(e^x - \frac{1}{x} \right) dx = e^x - \ln|x| + C$$

$$142) \int \frac{dx}{4x-2} = \frac{1}{4} \int \frac{4 dx}{4x-2} = \frac{1}{4} \ln|4x-2| + C$$

$$143) \int \frac{dx}{2-x} = - \int \frac{-dx}{2-x} = - \ln|2-x| + C$$

$$144) \int \frac{x}{1-x^2} dx = -\frac{1}{2} \int \frac{-2x dx}{1-x^2} = -\frac{1}{2} \ln|1-x^2| + C$$

$$145) \int \frac{3dx}{(x+1)^4} = 3 \int (x+1)^{-4} dx = 3 \frac{(x+1)^{-3}}{-3} + C = \frac{-1}{(x+1)^3} + C$$

$$146) \int \frac{x^3}{1+x^4} dx = \frac{1}{4} \int \frac{4x^3}{1+x^4} dx = \frac{1}{4} \ln |1+x^4| + C$$

$$147) \int \frac{\operatorname{sen}(2x)}{1+\operatorname{sen}^2 x} dx = \int \frac{2\operatorname{sen} x \cos x}{1+\operatorname{sen}^2 x} dx = \ln |1+\operatorname{sen}^2 x| + C$$

$$\operatorname{sen}(2x) = 2\operatorname{sen} x \cdot \cos x$$

$$148) \int \frac{x+2}{\sqrt{x^2+4x+2}} dx = \frac{1}{2} \int 2(x+2) (x^2+4x+2)^{-1/2} dx =$$

$$= \frac{1}{2} \frac{(x^2+4x+2)^{1/2}}{1/2} + C = \sqrt{x^2+4x+2} + C$$

$$149) \int e^x (\sqrt{1-e^x}) dx = - \int -e^x (1-e^x)^{1/2} dx = - \frac{(1-e^x)^{3/2}}{3/2} + C =$$

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

$$150) \int \frac{\ln x}{x} dx = \int \frac{1}{x} \cdot \ln x dx = \frac{(\ln x)^2}{2} + C$$

$$151) \int x \sqrt{x^2+5} dx = \frac{1}{2} \int 2x (x^2+5)^{1/2} dx = \frac{1}{2} \frac{(x^2+5)^{3/2}}{3/2} + C =$$

$$= \frac{1}{3} \sqrt{(x^2+5)^3} + C$$

$$152) \int \operatorname{sen}(7x) dx = \frac{1}{7} \int 7 \operatorname{sen}(7x) dx = -\frac{1}{7} \cos(7x) + C$$

$$153) \int 8x \cos x^2 dx = \frac{8}{2} \int 2x \cos x^2 dx = 4 \operatorname{sen}(x^2) + C$$

$$154) \int \frac{\cos x}{1 + \operatorname{sen}^2 x} dx = \operatorname{arctg}(\operatorname{sen} x) + C$$

$$155) \int \frac{dx}{\cos^2 x \sqrt{1 - \tan^2 x}} = \int \frac{1/\cos^2 x dx}{\sqrt{1 - (\operatorname{tg} x)^2}} = \operatorname{arcsen}(\operatorname{tg} x) + C$$

$$156) \int 4x^2 \cdot e^{x^3} dx = \frac{4}{3} \int 3x^2 \cdot e^{x^3} dx = \frac{4}{3} e^{x^3} + C$$

$$157) \int \frac{3x^2}{1+x^6} dx = \int \frac{3x^2}{1+(x^3)^2} dx = \operatorname{arctg}(x^3) + C$$

$$158) \int 3^x dx = \frac{3^x}{\ln 3} + C$$

$$159) \int \frac{dx}{4+x^2} dx = \int \frac{dx}{\frac{4}{4} + \frac{x^2}{4}} = \frac{1}{4} \int \frac{1/2 dx}{1 + (\frac{x}{2})^2} = \frac{1}{2} \operatorname{arctg}\left(\frac{x}{2}\right) + C$$

$$160) \int e^{5x} dx = \frac{1}{5} \int 5 e^{5x} dx = \frac{1}{5} e^{5x} + C$$

$$161) \int (e^x + e^{-x})^2 dx = \int (e^{2x} + 2e^x e^{-x} + e^{-2x}) dx = \int (e^{2x} + 2 + e^{-2x}) dx$$

$$= \frac{1}{2} \int 2e^{2x} dx + \int 2 dx + \frac{-1}{2} \int -2e^{-2x} dx = \frac{1}{2} e^{2x} + 2x - \frac{1}{2} e^{-2x} + C$$

$$162) \int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx = 2 \int \frac{e^{\sqrt{x}}}{2\sqrt{x}} dx = e^{\sqrt{x}} + C$$

$$163) \int \frac{\operatorname{sen} x}{e^{\cos x}} dx = \int \operatorname{sen} x \cdot e^{-\cos x} dx = e^{-\cos x} + C$$

$$164) \int \underbrace{x^2}_{dv} \cdot \underbrace{\ln x}_u dx = \frac{x^3}{3} \cdot \ln x - \int \frac{x^3}{3} \cdot \frac{1}{x} dx = \textcircled{*}$$

$$\begin{aligned} u &= \ln x & du &= \frac{1}{x} dx \\ dv &= x^2 dx & v &= \frac{x^3}{3} \end{aligned} \quad \textcircled{*} = \frac{x^3}{3} \ln x - \frac{x^3}{9} + C$$

$$165) \int \underbrace{x}_{dv} \cdot \underbrace{\operatorname{arctg} x}_u dx = \frac{x^2}{2} \operatorname{arctg} x - \int \frac{x^2}{2} \cdot \frac{1}{1+x^2} dx = \textcircled{*}$$

$$\begin{aligned} u &= \operatorname{arctg} x & du &= \frac{1}{1+x^2} dx \\ dv &= x dx & v &= \frac{x^2}{2} \end{aligned} \quad \textcircled{*} = \frac{x^2}{2} \operatorname{arctg} x - \frac{1}{2} \int \frac{x^2}{1+x^2} dx = \textcircled{\ddot{i}}$$

La hacemos a parte!!

$$\int \frac{x^2}{1+x^2} dx = \int 1 dx + \int \frac{-1}{1+x^2} dx = x - \operatorname{arctg} x$$

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

$$\textcircled{\ddot{i}} = \frac{x^2}{2} \operatorname{arctg} x - \frac{1}{2} \cdot [x - \operatorname{arctg} x] + C$$

$$166) \int \frac{x+2}{x^2+x-6} dx = \textcircled{*}$$

$$x^2+x-6=0 \Rightarrow x = \frac{-1 \pm \sqrt{1+24}}{2} \begin{cases} x=2 \rightarrow \text{Real Simple} \\ x=-3 \rightarrow \text{Real Simple} \end{cases}$$

$$\frac{x+2}{x^2+x-6} = \frac{A}{x-2} + \frac{B}{x+3} = \frac{A(x+3)+B(x-2)}{(x-2)(x+3)}$$

$$\Rightarrow x+2 = A(x+3)+B(x-2)$$

$$\text{Si } x=2 \rightarrow 4 = 5A \rightarrow A = \frac{4}{5}$$

$$\text{Si } x=-3 \rightarrow -1 = -5B \rightarrow B = \frac{1}{5}$$

$$\textcircled{*} = \int \frac{4/5}{x-2} dx + \int \frac{1/5}{x+3} dx = \frac{4}{5} \ln|x-2| + \frac{1}{5} \ln|x+3| + C$$

$$167) \int \frac{dx}{x^2+5x+6} = \textcircled{*}$$

$$x^2+5x+6=0 \Rightarrow x = \frac{-5 \pm \sqrt{25-24}}{2} \begin{cases} x=-2 \rightarrow \text{Real Simple} \\ x=-3 \rightarrow \text{Real Simple} \end{cases}$$

$$\frac{1}{x^2+5x+6} = \frac{A}{x+2} + \frac{B}{x+3} = \frac{A(x+3)+B(x+2)}{(x+2)(x+3)}$$

$$\Rightarrow 1 = A(x+3)+B(x+2)$$

$$\text{Si } x=-2 \rightarrow 1 = A$$

$$\text{Si } x=-3 \rightarrow 1 = -B \Rightarrow B = -1$$

$$\textcircled{*} = \int \frac{1}{x+2} dx + \int \frac{-1}{x+3} dx = \ln|x+2| - \ln|x+3| + C$$

$$168) \int \frac{x^3+1}{x^2+x-2} dx = \int (x-1) dx + \int \frac{3x-1}{x^2+x-2} dx = \text{😊}$$

$$\begin{array}{r} x^3 + 0x^2 + 0x + 1 \quad | \quad x^2 + x - 2 \\ -x^3 - x^2 + 2x \\ \hline -x^2 + 2x + 1 \\ +x^2 + x - 2 \\ \hline 3x - 1 \end{array}$$

↓
da hacemos a parte

$$\begin{aligned} x^2 + x - 2 &= 0 \\ x &= \frac{-1 \pm \sqrt{1+8}}{2} \end{aligned} \begin{array}{l} \rightarrow x = 1 \\ \rightarrow x = -2 \end{array}$$

$$\frac{3x-1}{x^2+x-2} = \frac{A}{x-1} + \frac{B}{x+2} = \frac{A(x+2) + B(x-1)}{(x-1)(x+2)}$$

$$\Rightarrow 3x-1 = A(x+2) + B(x-1)$$

$$\text{Si } x=1 \rightarrow 2 = 3A \Rightarrow A = 2/3$$

$$\text{Si } x=-2 \rightarrow -7 = -3B \Rightarrow B = 7/3$$

$$\int \frac{3x-1}{x^2+x-2} dx = \int \frac{2/3}{x-1} dx + \int \frac{7/3}{x+2} dx = \frac{2}{3} \ln|x-1| + \frac{7}{3} \ln|x+2|$$

$$\text{😊} = \frac{x^2}{2} - x + \frac{2}{3} \ln|x-1| + \frac{7}{3} \ln|x+2| + C$$

$$169) \int \frac{1}{x^2+3x} dx = \textcircled{*}$$

$$x^2+3x=0 \Rightarrow x(x+3)=0 \begin{cases} \rightarrow x=0 \\ \rightarrow x=-3 \end{cases}$$

$$\frac{1}{x^2+3x} = \frac{A}{x} + \frac{B}{x+3} = \frac{A(x+3) + Bx}{x(x+3)}$$

$$\Rightarrow 1 = A(x+3) + Bx$$

$$\text{Si } x=-3 \rightarrow 1 = -3B \Rightarrow B = -\frac{1}{3}$$

$$\text{Si } x=0 \rightarrow 1 = 3A \Rightarrow A = \frac{1}{3}$$

$$\textcircled{*} = \int \frac{1/3}{x} dx + \int \frac{-1/3}{x+3} dx = \frac{1}{3} \ln|x| - \frac{1}{3} \ln|x+3| + C$$

$$170) \int \frac{1}{\sin x \cos x} dx = \int \frac{\sin^2 x + \cos^2 x}{\sin x \cdot \cos x} dx = \int \frac{\sin^2 x}{\sin x \cdot \cos x} dx + \int \frac{\cos^2 x}{\sin x \cdot \cos x} dx$$

$$= - \int \frac{\sin x}{\cos x} dx + \int \frac{\cos x}{\sin x} dx = -\ln|\cos x| + \ln|\sin x| + C$$

$$= \ln|\tan x| + C$$

$$171) \int \frac{2x-3}{x+2} dx = \int 2 dx + \int \frac{-7}{x+2} dx =$$

$$\begin{array}{r} 2x - 3 \\ -2x - 4 \\ \hline -7 \end{array} \quad \frac{|x+2|}{2} = 2x - 7 \cdot \ln|x+2| + C'$$

$$172) \int \frac{dx}{x^2-4} = \textcircled{*}$$

$$x^2 - 4 = 0 \Rightarrow x^2 = 4 \begin{cases} x = 2 \rightarrow \text{Real Simple} \\ x = -2 \rightarrow \text{Real Simple} \end{cases}$$

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

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

$$\text{Si } x=2 \rightarrow 1 = 4B \rightarrow B = 1/4$$

$$\text{Si } x=-2 \rightarrow 1 = -4A \rightarrow A = -1/4$$

$$\textcircled{*} = \int \frac{-1/4}{x+2} dx + \int \frac{1/4}{x-2} dx = -\frac{1}{4} \ln|x+2| + \frac{1}{4} \ln|x-2| + C'$$

$$173) \int \frac{x-1}{x^2+x-6} dx = \textcircled{*}$$

$$x^2 + x - 6 = 0 \Rightarrow x = \frac{-1 \pm \sqrt{1+24}}{2} \begin{cases} x = 2 \rightarrow \text{Real Simple} \\ x = -3 \rightarrow \text{Real Simple} \end{cases}$$

$$\frac{x-1}{x^2+x-6} = \frac{A}{x-2} + \frac{B}{x+3} = \frac{A(x+3)+B(x-2)}{(x-2)(x+3)}$$

$$\Rightarrow x-1 = A(x+3) + B(x-2)$$

$$\text{Si } x=2 \rightarrow 1 = 5A \Rightarrow A = 1/5$$

$$\text{Si } x=-3 \rightarrow -4 = -5B \Rightarrow B = 4/5$$

$$\textcircled{*} = \int \frac{1/5}{x-2} dx + \int \frac{4/5}{x+3} dx = \frac{1}{5} \ln|x-2| + \frac{4}{5} \ln|x+3| + C'$$

$$174) \int \frac{e}{x^2+5x+6} dx = \textcircled{*}$$

$$x^2+5x+6 = 0 \Rightarrow x = \frac{-5 \pm \sqrt{25-24}}{2} \begin{cases} \rightarrow x = -2 \text{ Real Simple} \\ \rightarrow x = -3 \text{ Real Simple} \end{cases}$$

$$\frac{e}{x^2+5x+6} = \frac{A}{x+2} + \frac{B}{x+3} = \frac{A(x+3)+B(x+2)}{(x+2)(x+3)}$$

$$\Rightarrow e = A(x+3) + B(x+2)$$

$$\text{Si } x = -2 \rightarrow e = A$$

$$\text{Si } x = -3 \rightarrow e = -B \Rightarrow B = -e$$

$$\textcircled{*} = \int \frac{e}{x+2} dx + \int \frac{-e}{x+3} dx = e \ln|x+2| - e \ln|x+3| + C'$$

$$175) \int \frac{x+1}{x \cdot (x-1)^2} dx = \textcircled{*}$$

$$x \cdot (x-1)^2 = 0 \text{ (ya está factorizado!)} \begin{cases} x=0 \\ x=1 \text{ (Doble)} \end{cases}$$

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

$$\Rightarrow x+1 = A(x-1)^2 + Bx + Cx(x-1)$$

$$\text{Si } x=0 \rightarrow 1 = A$$

$$\text{Si } x=1 \rightarrow 2 = B$$

$$\text{Si } x=2 \rightarrow 3 = A + 2B + 2C \rightarrow C = -1$$

$$\textcircled{*} = \int \frac{1}{x} dx + \int \frac{2}{(x-1)^2} dx + \int \frac{-1}{x-1} dx =$$

$$= \ln|x| + 2 \int (x-1)^{-2} dx - \ln|x-1| =$$

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

$$= \ln|x| - \frac{2}{(x-1)} - \ln|x-1| + C$$

$$176) \int \frac{dx}{x^2+2x} = \textcircled{*}$$

$$x^2+2x=0 \Rightarrow x(x+2)=0 \begin{cases} x=0 \\ x+2=0 \rightarrow x=-2 \end{cases}$$

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

$$\Rightarrow 1 = A(x+2) + Bx$$

$$\text{Si } x=0 \rightarrow 1 = 2A \Rightarrow A = 1/2$$

$$\text{Si } x=-2 \rightarrow 1 = -2B \Rightarrow B = -1/2$$

$$\oplus = \int \frac{1/2}{x} dx + \int \frac{-1/2}{x+2} dx = \frac{1}{2} \ln|x| - \frac{1}{2} \ln|x+2| + C$$

$$177) \int \frac{x^2+1}{x^2+x-6} dx = \int 1 dx + \int \frac{-x+7}{x^2+x-6} dx = \text{😊}$$

$$\begin{array}{r} x^2+0x+1 \quad | \quad x^2+x-6 \\ -x^2-x+6 \quad | \quad 1 \\ \hline -x+7 \end{array}$$

↓
da hacemos a parte

$$x^2+x-6=0$$

$$x = \frac{-1 \pm \sqrt{1+24}}{2} \begin{cases} \rightarrow x=2 \\ \rightarrow x=-3 \end{cases}$$

$$\frac{-x+7}{x^2+x-6} = \frac{A}{x-2} + \frac{B}{x+3} = \frac{A(x+3) + B(x-2)}{(x-2)(x+3)}$$

$$\Rightarrow -x+7 = A(x+3) + B(x-2)$$

$$\text{Si } x=2 \rightarrow 5 = 5A \Rightarrow A=1$$

$$\text{Si } x=-3 \rightarrow 10 = -5B \Rightarrow B=-2$$

$$\int \frac{-x+7}{x^2+x-6} dx = \int \frac{1}{x-2} dx + \int \frac{-2}{x+3} dx = \ln|x-2| - 2\ln|x+3|$$

$$\Rightarrow \text{😊} = x + \ln|x-2| - 2 \ln|x+3| + C'$$

$$178) \int \frac{x^3-1}{x^2+x} dx = \int (x-1) dx + \int \frac{x-1}{x^2+x} dx = \text{😊}$$

$$\begin{array}{r} x^3 + 0x^2 + 0x - 1 \quad | \quad x^2 + x \\ -x^3 - x^2 \\ \hline -x^2 + 0x \\ +x^2 + x \\ \hline x - 1 \end{array}$$

↓
la hacemos a parte

$$x^2+x=0 \rightarrow x(x+1)=0$$

$$\begin{array}{l} \swarrow x=0 \\ \searrow x=-1 \end{array}$$

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

$$\Rightarrow x-1 = A(x+1) + Bx$$

$$\text{Si } x=0 \rightarrow -1 = A$$

$$\text{Si } x=-1 \rightarrow -2 = -B \rightarrow B=2$$

$$\int \frac{x-1}{x^2+x} dx = \int \frac{-1}{x} dx + \int \frac{2}{x+1} dx = -\ln|x| + 2 \ln|x+1|$$

$$\Rightarrow \text{😊} = \frac{x^2}{2} - x - \ln|x| + 2 \ln|x+1| + C'$$

$$179) \int \frac{x^2 + 1}{x^2 - 1} dx = \int 1 dx + \int \frac{2}{x^2 - 1} dx = \text{😊}$$

$$\begin{array}{r} x^2 \cancel{+ 0x} + 1 \\ -x^2 \quad + 1 \\ \hline 2 \end{array} \quad \left| \right. \quad \frac{x^2 - 1}{1}$$

La hacemos a parte

$$x^2 - 1 = 0 \begin{cases} \rightarrow x = 1 \\ \rightarrow x = -1 \end{cases}$$

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

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

$$\text{Si } x = 1 \rightarrow 2 = 2A \Rightarrow A = 1$$

$$\text{Si } x = -1 \rightarrow 2 = -2B \Rightarrow B = -1$$

$$\int \frac{2}{x^2 - 1} dx = \int \frac{1}{x - 1} dx + \int \frac{-1}{x + 1} dx = \ln|x - 1| - \ln|x + 1|$$

$$\Rightarrow \text{😊} = x + \ln|x - 1| - \ln|x + 1| + C$$

$$180) \int \frac{1}{x^2(x + 1)} dx = \text{☹}$$

$$x^2 \cdot (x + 1) = 0 \text{ (Ya está factorizado!)} \begin{cases} \rightarrow x = 0 \text{ (Doble)} \\ \rightarrow x + 1 = 0 \rightarrow x = -1 \end{cases}$$

$$\frac{1}{x^2(x + 1)} = \frac{A}{x^2} + \frac{B}{x} + \frac{C}{x + 1} = \frac{A(x + 1) + Bx(x + 1) + Cx^2}{x^2(x + 1)}$$

$$\Rightarrow 1 = A(x+1) + Bx(x+1) + Cx^2$$

$$\text{Si } x=0 \rightarrow 1 = A$$

$$\text{Si } x=-1 \Rightarrow 1 = C$$

$$\text{Si } x=1 \Rightarrow 1 = 2A + 2B + C \Rightarrow B = -1$$

$$\textcircled{4} = \int \frac{1}{x^2} dx + \int \frac{-1}{x} dx + \int \frac{1}{x+1} dx =$$

$$= \int x^{-2} dx - \ln|x| + \ln|x+1| + C =$$

$$= \frac{x^{-1}}{-1} - \ln|x| + \ln|x+1| + C = \frac{-1}{x} - \ln|x| + \ln|x+1| + C$$

$$184) \int \frac{1}{x^2-9} dx = \textcircled{*}$$

$$x^2-9=0; x^2=9 \begin{cases} \rightarrow x=+3 \\ \rightarrow x=-3 \end{cases}$$

$$\frac{1}{x^2-9} = \frac{A}{x+3} + \frac{B}{x-3} = \frac{A(x-3) + B(x+3)}{(x+3)(x-3)}$$

$$\Rightarrow 1 = A(x-3) + B(x+3)$$

$$\text{Si } x=3 \rightarrow 1 = 6B \Rightarrow B = 1/6$$

$$\text{Si } x=-3 \rightarrow 1 = -6A \Rightarrow A = -1/6$$

$$\textcircled{7} = \int \frac{-1/6}{x+3} dx + \int \frac{1/6}{x-3} dx = \frac{-1}{6} \ln|x+3| + \frac{1}{6} \ln|x-3| + C$$

$$182) \int \frac{x}{(x-1)^2 \cdot (x+1)} dx = \textcircled{*}$$

$$(x-1)^2(x+1) = 0 \quad (\text{ya est\u00e1 factorizado!}) \begin{cases} x=1 \text{ (Doble)} \\ x=-1 \end{cases}$$

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

$$\Rightarrow x = A(x-1)(x+1) + B(x+1) + C(x-1)^2$$

$$\text{Si } x=1 \rightarrow 1 = 2B \Rightarrow B = 1/2$$

$$\text{Si } x=-1 \rightarrow -1 = 4C \Rightarrow C = -1/4$$

$$\text{Si } x=0 \rightarrow 0 = -A + B + C \Rightarrow A = B + C = 1/4$$

$$\textcircled{*} = \int \frac{1/4}{x-1} dx + \int \frac{1/2}{(x-1)^2} dx + \int \frac{-1/4}{x+1} dx =$$

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

$$= \frac{1}{4} \ln|x-1| + \frac{1}{2} \cdot \frac{(x-1)^{-1}}{-1} - \frac{1}{4} \ln|x+1| + C' =$$

$$= \frac{1}{4} \ln|x-1| - \frac{1}{2(x-1)} - \frac{1}{4} \ln|x+1| + C'$$

$$183) \int \frac{6}{x \cdot (x-1) \cdot (x+2)} dx = \textcircled{*}$$

$$x \cdot (x-1) \cdot (x+2) = 0 \text{ (ya está factorizado!)} \begin{cases} \rightarrow x=0 \\ \rightarrow x=1 \\ \rightarrow x=-2 \end{cases}$$

$$\frac{6}{x(x-1)(x+2)} = \frac{A}{x} + \frac{B}{x-1} + \frac{C}{x+2} = \frac{A(x-1)(x+2) + Bx(x+2) + Cx(x-1)}{x(x-1)(x+2)}$$

$$\Rightarrow 6 = A(x-1)(x+2) + Bx(x+2) + Cx(x-1)$$

$$\text{Si } x=0 \rightarrow 6 = -2A \Rightarrow A = -3$$

$$\text{Si } x=1 \rightarrow 6 = 3B \Rightarrow B = 2$$

$$\text{Si } x=-2 \rightarrow 6 = 6C \Rightarrow C = 1$$

$$\textcircled{*} = \int \frac{-3}{x} dx + \int \frac{2}{x-1} dx + \int \frac{1}{x+2} dx = -3 \ln|x| + 2 \ln|x-1| + \ln|x+2| + C$$

$$184) \int \frac{3}{x^3-1} dx = \textcircled{\oplus}$$

$$x^3 - 1 = 0 \rightarrow \begin{array}{c|cccc} & 1 & 0 & 0 & -1 \\ \hline 1 & & & & \\ \hline & 1 & 1 & 1 & \\ \hline & 1 & 1 & 1 & 0 \end{array}$$

solución real

$$x^2 + x + 1 = 0$$

$$x = \frac{-1 \pm \sqrt{1-4}}{2} \Rightarrow$$

$$x = \frac{-1 \pm i\sqrt{3}}{2} = -\frac{1}{2} \pm i \cdot \frac{\sqrt{3}}{2}$$

α β

$$\Rightarrow x^2 + x + 1 = (x - \alpha)^2 + \beta^2 = \left(x + \frac{1}{2}\right)^2 + \frac{3}{4}$$

Soluciones Complejas

$$\frac{3}{x^3-1} = \frac{A}{x-1} + \frac{Mx+N}{x^2+x+1} = \frac{A(x^2+x+1) + Mx(x-1) + N(x-1)}{(x-1)(x^2+x+1)}$$

$$\Rightarrow 3 = A(x^2+x+1) + Mx(x-1) + N(x-1)$$

$$\text{Si } x = 1 \rightarrow 3 = 3A \Rightarrow A = 1$$

$$\text{Si } x = 0 \rightarrow 3 = A - N \Rightarrow N = -2$$

$$\text{Si } x = 2 \rightarrow 3 = 7A + 2M + N \rightarrow M = -1$$

$$\textcircled{*} = \int \frac{1}{x-1} dx + \int \frac{-x-2}{x^2+x+1} dx = \int \frac{1}{x-1} dx - \int \frac{x+2}{x^2+x+1} dx = \text{😊}$$

↓
de hacemos a parte

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

$$= \frac{1}{2} \ln|x^2+x+1| + \int \frac{3/2 dx}{\frac{3 \cdot 4}{4 \cdot 3} \left[\frac{3}{4} + (x+\frac{1}{2})^2 \right]} =$$

$$= \frac{1}{2} \ln|x^2+x+1| + \frac{4}{3} \int \frac{3/2 dx}{1 + \left(\frac{2}{\sqrt{3}}(x+\frac{1}{2})\right)^2} = \frac{1}{2} \ln|x^2+x+1| + 2 \cdot \frac{3}{2} \int \frac{1 \cdot \frac{2}{\sqrt{3}} dx}{1 + \left[\frac{2}{\sqrt{3}}(x+\frac{1}{2})\right]^2}$$

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

$$\Rightarrow \text{😊} = \ln|x-1| - \frac{1}{2} \ln|x^2+x+1| - \sqrt{3} \cdot \arctg\left[\frac{2}{\sqrt{3}}(x+\frac{1}{2})\right] + C'$$

$$185) \int \frac{5x^2-2x+25}{x^3-6x^2+25x} dx = \text{⊛}$$

$$x^3-6x^2+25x=0 \Rightarrow x(x^2-6x+25)=0 \begin{cases} x=0 \\ x^2-6x+25=0 \end{cases}$$

$$x^2-6x+25=0 \rightarrow x = \frac{6 \pm \sqrt{36-100}}{2} = \frac{6 \pm 8i}{2} = 3 \pm 4i$$

$$\frac{5x^2-2x+25}{x^3-6x^2+25x} = \frac{A}{x} + \frac{Mx+N}{x^2-6x+25} = \frac{A(x^2-6x+25)+Mx^2+Nx}{x(x^2-6x+25)}$$

$$\Rightarrow 5x^2-2x+25 = A(x^2-6x+25)+Mx^2+Nx$$

$$\text{Si } x=0 \rightarrow 25 = 25A \Rightarrow A=1$$

$$\text{Si } x=1 \rightarrow 28 = 20A + M + N \rightarrow 8 = M + N$$

$$\text{Si } x=-1 \rightarrow 32 = 32A + M - N \rightarrow 0 = M - N$$

$$8 = 2M \Rightarrow M=4$$

$$\Downarrow \\ N=4$$

$$\text{⊛} = \int \frac{1}{x} dx + \int \frac{4x+4}{x^2-6x+25} dx = \text{😊}$$

↓ La hacemos a parte!

$$\int \frac{4x+4}{x^2-6x+25} dx = \int \frac{4x}{x^2-6x+25} dx + \int \frac{4}{(x-3)^2+16} dx =$$

$$= \frac{4}{2} \int \frac{2x-6}{x^2-6x+25} dx + \int \frac{4+6 \cdot 2}{(x-3)^2+16} dx =$$

$$= 2 \int \frac{2x-6}{x^2-6x+25} dx + 16 \cdot \int \frac{1}{\frac{16}{16} [16+(x-3)^2]} dx =$$

$$= 2 \ln |x^2-6x+25| + 4 \cdot \int \frac{1 \cdot \frac{1}{4} dx}{1 + \left[\frac{x-3}{4}\right]^2} =$$

$$= 2 \ln |x^2-6x+25| + 4 \cdot \operatorname{arctg} \left(\frac{x-3}{4} \right)$$

$$\Rightarrow \text{😊} = \ln x + 2 \ln |x^2-6x+25| + 4 \operatorname{arctg} \left(\frac{x-3}{4} \right) + C'$$

$$186) \int (1-x)^2 dx = (-1) \cdot \int (-1) \cdot (1-x)^2 dx = -\frac{(1-x)^3}{3} + C$$

$$187) \int (1-x^2)^2 dx = \int (1-2x^2+x^4) dx = x - 2 \cdot \frac{x^3}{3} + \frac{x^5}{5} + C$$

$$188) \int 2x \sqrt{x^2+3} dx = \int 2x \cdot (x^2+3)^{1/2} dx = \frac{(x^2+3)^{3/2}}{3/2} = \frac{2}{3} \sqrt{(x^2+3)^3} + C$$

$$189) \int x(x^2+3) dx = \frac{1}{2} \int 2x(x^2+3) dx = \frac{1}{2} \cdot \frac{(x^2+3)^2}{2} = \frac{(x^2+3)^2}{4} + C$$

$$190) \int (x-2)(x^2-4x+1)^3 dx = \frac{1}{2} \int 2(x-2)(x^2-4x+1)^3 dx = \frac{1}{2} \cdot \frac{(x^2-4x+1)^4}{4} + C$$

$$191) \int \sqrt{2x-1} dx = \int (2x-1)^{1/2} dx = \frac{1}{2} \int 2 \cdot (2x-1)^{1/2} dx = \frac{1}{2} \cdot \frac{(2x-1)^{3/2}}{3/2} =$$

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

$$192) \int x \sqrt{x^2-2} dx = \int x \cdot (x^2-2)^{1/2} dx = \frac{1}{2} \int 2x \cdot (x^2-2)^{1/2} dx =$$

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

$$193) \int e^{2x} dx = \frac{1}{2} \int 2e^{2x} dx = \frac{1}{2} \cdot e^{2x} + C$$

$$194) \int (x+1) \cdot e^{x^2+2x-1} \cdot dx = \frac{1}{2} \int 2(x+1) \cdot e^{x^2+2x-1} dx = \frac{1}{2} e^{x^2+2x-1} + C$$

$$195) \int \frac{4x}{2x^2+1} dx = \ln |2x^2+1| + C$$

$$196) \int \frac{x^2}{x^3+3} dx = \frac{1}{3} \int \frac{3x^2}{x^3+3} dx = \frac{1}{3} \ln |x^3+3| + C$$

$$197) \int \frac{x+1}{x^2+2x} dx = \frac{1}{2} \int \frac{2(x+1)}{x^2+2x} dx = \frac{1}{2} \ln |x^2+2x| + C$$

$$198) \int \frac{5x}{1-x^2} dx = \frac{-5}{2} \int \frac{-2x}{1-x^2} dx = \frac{-5}{2} \cdot \ln |1-x^2| + C$$

$$199) \int \frac{4x^3}{x^4+2} dx = \ln |x^4+2| + C$$

$$200) \int \frac{4x^3}{(x^4+2)^2} dx = \int 4x^3 \cdot (x^4+2)^{-2} dx = \frac{(x^4+2)^{-1}}{-1} = \frac{-1}{x^4+2} + C$$

$$201) \int \frac{4x^3}{\sqrt[3]{x^4+2}} dx = \int 4x^3 \cdot (x^4+2)^{-1/3} dx = \frac{(x^4+2)^{2/3}}{2/3} = \frac{3 \sqrt[3]{(x^4+2)^2}}{2} + C$$

$$202) \int \frac{x-1}{\sqrt{x^2-2x}} dx = \int (x-1) \cdot (x^2-2x)^{-1/2} dx = \frac{1}{2} \int 2(x-1) \cdot (x^2-2x)^{-1/2} dx =$$

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

$$203) \int 3^{x/2} dx = 2 \cdot \int \frac{1}{2} \cdot 3^{x/2} dx = \frac{2 \cdot 3^{x/2}}{\ln 3} + C$$

$$204) \int e^{x+1} dx = e^{x+1} + C$$

$$205) \int \left(\frac{1}{2}\right)^{4x} dx = \frac{1}{4} \int 4 \cdot \left(\frac{1}{2}\right)^{4x} dx = \frac{1}{4} \cdot \left(\frac{1}{2}\right)^{4x} \cdot \frac{1}{\ln(1/2)} =$$

$$= \frac{-1}{\ln 2 \cdot 2^{4x+2}} + C$$

$$206) \int (e^{-3x} + e^{x-2}) dx = \int e^{-3x} dx + \int e^{x-2} dx =$$

$$= -\frac{1}{3} \int -3 \cdot e^{-3x} dx + \int e^{x-2} dx = -\frac{1}{3} e^{-3x} + e^{x-2} + C$$

$$207) \int 7^{x^2+1} \cdot 2x \cdot dx = \frac{7^{x^2+1}}{\ln 7} + C$$

$$208) \int 5 \cdot e^{\frac{x}{2}+2} dx = 5 \cdot 2 \int \frac{1}{2} e^{\frac{x}{2}+2} dx = 10 \cdot e^{\frac{x}{2}+2} + C$$

$$209) \int \frac{3^{5x-1}}{7} dx = \frac{1}{7} \cdot \frac{1}{5} \int 5 \cdot 3^{5x-1} dx = \frac{1}{35} \cdot \frac{3^{5x-1}}{\ln 3} + C$$

$$210) \int \frac{x}{e^{x^2}} dx = \int x \cdot e^{-x^2} dx = -\frac{1}{2} \int -2x \cdot e^{-x^2} dx = -\frac{1}{2} \cdot e^{-x^2} + C$$

$$211) \int \operatorname{secc}(2x) dx = \frac{1}{2} \int 2 \operatorname{secc}(2x) dx = -\frac{1}{2} \cos(2x) + C'$$

$$212) \int \cos(x+1) dx = \operatorname{secc}(x+1) + C'$$

$$213) \int \frac{\operatorname{secc}\left(\frac{x}{2}\right)}{2} dx = -\cos\left(\frac{x}{2}\right) + C'$$

$$214) \int \operatorname{secc}(-x) dx = -1 \cdot \int -1 \operatorname{secc}(-x) dx = +\cos(-x) + C'$$

$$215) \int \frac{1}{\cos^2(x+1)} dx = \operatorname{tg}(x+1) + C'$$

$$216) \int -3 \cdot \operatorname{secc}(2x+1) dx = -3 \cdot \frac{1}{2} \int 2 \operatorname{secc}(2x+1) dx = +\frac{3}{2} \cos(2x+1) + C'$$

$$217) \int (x+1) \cos(x^2+2x) dx = \frac{1}{2} \int 2(x+1) \cdot \cos(x^2+2x) dx = \frac{1}{2} \operatorname{secc}(x^2+2x) + C'$$

$$218) \int \frac{x}{\cos^2(x^2-3)} dx = \frac{1}{2} \int \frac{2x dx}{\cos^2(x^2-3)} = \frac{1}{2} \operatorname{tg}(x^2-3) + C'$$

$$219) \int \frac{1}{\sqrt{1-25x^2}} dx = \frac{1}{5} \int \frac{5}{\sqrt{1-(5x)^2}} dx = \frac{1}{5} \cdot \operatorname{arcsecc}(5x) + C'$$

$$220) \int \frac{1}{\sqrt{1-(2x-3)^2}} dx = \frac{1}{2} \int \frac{2 dx}{\sqrt{1-(2x-3)^2}} = \frac{1}{2} \operatorname{arcsecc}(2x-3) + C'$$

$$221) \int \frac{x}{1+(x-3)^2} dx = \frac{1}{2} \int \frac{2x-6+6}{x^2-6x+10} dx = (*)$$

$$1+(x-3)^2 = 1+x^2-6x+9 = x^2-6x+10$$

$$(*) = \frac{1}{2} \int \frac{2x-6}{x^2-6x+10} dx + \frac{1}{2} \int \frac{6}{1+(x-3)^2} dx =$$

$$= \frac{1}{2} \ln |x^2-6x+10| + 3 \arctg(x-3) + C'$$

$$222) \int \frac{x}{1+9x^4} dx = \frac{1}{6} \int \frac{6x}{1+(3x^2)^2} dx = \frac{1}{6} \arctg(3x^2) + C'$$

$$223) \int \frac{(x^2+x) \cdot e^{-2x+1}}{u} dx = -\frac{1}{2} (x^2+x) \cdot e^{-2x+1} + \int \frac{(x+\frac{1}{2}) \cdot e^{-2x+1}}{u} dx = (*)$$

$$u = x^2+x \quad du = (2x+1) dx \quad \parallel \quad u = x+\frac{1}{2} \quad du = dx$$

$$dv = e^{-2x+1} dx \quad v = -\frac{1}{2} e^{-2x+1} \quad \parallel \quad dv = e^{-2x+1} dx \quad v = -\frac{1}{2} e^{-2x+1}$$

$$(*) = -\frac{1}{2} (x^2+x) \cdot e^{-2x+1} - \frac{1}{2} (x+\frac{1}{2}) \cdot e^{-2x+1} + \int \frac{1}{2} e^{-2x+1} dx =$$

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

$$= -\frac{1}{2} (x^2+x) \cdot e^{-2x+1} - \frac{1}{2} (x+\frac{1}{2}) \cdot e^{-2x+1} - \frac{1}{4} e^{-2x+1} =$$

$$= -\frac{1}{2} e^{-2x+1} \cdot \left[x^2+x+x+\frac{1}{2}+\frac{1}{2} \right] = -\frac{1}{2} e^{-2x+1} (x^2+2x+1) + C'$$

$$224) \int \underbrace{x^2}_u \cdot \underbrace{\cos(3x)}_{dv} dx = \frac{1}{3} x^2 \operatorname{sen}(3x) - \int \frac{2}{3} x \operatorname{sen}(3x) dx = \textcircled{*}$$

$$u = x^2 \quad du = 2x dx \quad \left\| \quad u = \frac{2}{3} x \quad du = \frac{2}{3} dx \right. \\ dv = \cos(3x) dx \quad v = \frac{1}{3} \operatorname{sen}(3x) \quad \left\| \quad dv = \operatorname{sen}(3x) dx \quad v = -\frac{1}{3} \cos(3x)$$

$$\textcircled{*} = \frac{1}{3} x^2 \operatorname{sen}(3x) - \left[-\frac{2}{9} x \cos(3x) + \int \frac{2}{9} \cos(3x) dx \right] =$$

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

$$= \frac{1}{3} x^2 \operatorname{sen}(3x) + \frac{2}{9} x \cos(3x) - \frac{2}{27} \operatorname{sen}(3x) + C'$$

$$225) \int \underbrace{2x^2}_u \cdot \underbrace{\ln x}_{dv} dx = \frac{2x^3}{3} \ln x - \int \frac{2x^3}{3} \cdot \frac{1}{x} dx =$$

$$u = \ln x \quad du = \frac{1}{x} dx \quad \left\| \quad = \frac{2x^3}{3} \ln x - \frac{2}{3} \int x^2 dx = \frac{2x^3}{3} \ln x - \frac{2x^3}{9} + C \right. \\ dv = 2x^2 dx \quad v = \frac{2x^3}{3}$$

$$226) \int \underbrace{x^2}_u \cdot \underbrace{2^x}_{dv} dx = \frac{x^2 \cdot 2^x}{\ln 2} - \int \frac{2x}{\ln 2} \cdot 2^x dx = \textcircled{*}$$

$$u = x^2 \quad du = 2x dx \quad \left\| \quad u = \frac{2x}{\ln 2} \quad du = \frac{2}{\ln 2} dx \right. \\ dv = 2^x dx \quad v = \frac{2^x}{\ln 2} \quad \left\| \quad dv = 2^x dx \quad v = \frac{2^x}{\ln 2}$$

$$\textcircled{*} = \frac{x^2 \cdot 2^x}{\ln 2} - \left[\frac{2x \cdot 2^x}{(\ln 2)^2} - \int \frac{2 \cdot 2^x}{(\ln 2)^2} dx \right] =$$

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

$$= \frac{x^2 \cdot 2^x}{\ln 2} - \frac{2x \cdot 2^x}{(\ln 2)^2} + \frac{2 \cdot 2^x}{(\ln 2)^3} + C$$

$$227) \int \frac{2}{x^2-1} dx = \textcircled{*}$$

$$x^2-1=0 \begin{cases} \rightarrow x=1 \\ \rightarrow x=-1 \end{cases} \Rightarrow \frac{2}{x^2-1} = \frac{A}{x-1} + \frac{B}{x+1} = \frac{A(x+1)+B(x-1)}{(x-1)(x+1)}$$

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

$$\text{Si } x=1 \rightarrow 2 = 2A \Rightarrow A=1$$

$$\text{Si } x=-1 \rightarrow 2 = -2B \Rightarrow B=-1$$

$$\textcircled{*} = \int \frac{1}{x-1} dx + \int \frac{-1}{x+1} dx = \ln|x-1| - \ln|x+1| + C' =$$

$$= \ln\left(\left|\frac{x-1}{x+1}\right|\right) + C'$$

$$228) \int \frac{-3}{x^2+x-2} dx = \textcircled{*}$$

$$x^2+x-2=0 \rightarrow x = \frac{-1 \pm \sqrt{1+8}}{2} = \frac{-1 \pm 3}{2} \begin{cases} \rightarrow x=1 \\ \rightarrow x=-2 \end{cases}$$

$$\frac{-3}{x^2+x-2} = \frac{A}{x-1} + \frac{B}{x+2} = \frac{A(x+2)+B(x-1)}{(x-1)(x+2)}$$

$$\Rightarrow -3 = A(x+2) + B(x-1)$$

$$\text{Si } x=1 \rightarrow -3 = 3A \Rightarrow A = -1$$

$$\text{Si } x=-2 \rightarrow -3 = -3B \Rightarrow B = 1$$

$$\begin{aligned} \textcircled{*} &= \int \frac{-1}{x-1} dx + \int \frac{1}{x+2} dx = -1 \cdot \ln|x-1| + \ln|x+2| + C = \\ &= \ln\left(\frac{x+2}{x-1}\right) + C \end{aligned}$$

$$229) \int \frac{2x+1}{x^4-5x^2+4} dx = \textcircled{*}$$

$$x^4-5x^2+4=0 \rightarrow t^2-5t+4=0$$

$$\left. \begin{array}{l} x^2 = t \\ x^4 = (x^2)^2 = t^2 \end{array} \right\} \uparrow \quad t = \frac{5 \pm \sqrt{25-16}}{2} = \frac{5 \pm 3}{2} \begin{cases} \rightarrow t=4 \\ \rightarrow t=1 \end{cases}$$

$$t=4 \begin{cases} \rightarrow x=2 \\ \rightarrow x=-2 \end{cases} ; t=1 \begin{cases} \rightarrow x=1 \\ \rightarrow x=-1 \end{cases}$$

$$\frac{2x+1}{x^4-5x^2+4} = \frac{A}{x-2} + \frac{B}{x+2} + \frac{C}{x-1} + \frac{D}{x+1} =$$

$$= \frac{A(x+2)(x-1)(x+1) + B(x-2)(x-1)(x+1) + C(x-2)(x+2)(x+1) + D(x-2)(x+2)(x-1)}{(x-2)(x+2)(x-1)(x+1)}$$

$$\Rightarrow 2x+1 = A(x^2-1)(x+2) + B(x^2-1)(x-2) + C(x^2-4)(x+1) + D(x^2-4)(x-1)$$

$$\text{Si } x=2 \rightarrow 5 = 12A \Rightarrow A = 5/12$$

$$\text{Si } x=-2 \rightarrow -3 = -12B \Rightarrow B = 1/4$$

$$\text{Si } x=1 \rightarrow 3 = -6C \Rightarrow C = -1/2$$

$$\text{Si } x=-1 \rightarrow -1 = 6D \Rightarrow D = -1/6$$

$$\textcircled{*} = \int \frac{5/12}{x-2} dx + \int \frac{1/4}{x+2} dx + \int \frac{-1/2}{x-1} dx + \int \frac{-1/6}{x+1} dx =$$

$$= \frac{5}{12} \ln|x-2| + \frac{1}{4} \ln|x+2| - \frac{1}{2} \ln|x-1| - \frac{1}{6} \ln|x+1| + C$$

$$230) \int \frac{7x-2}{x^3-2x^2-x+2} dx = \textcircled{*}$$

$$x^3-2x^2-x+2=0$$

$$\begin{array}{r|rrrr} & 1 & -2 & -1 & 2 \\ 1 & & 1 & -1 & -2 \\ \hline & 1 & -1 & -2 & 0 \end{array}$$

$$x^2 - x - 2 = 0; \quad x = \frac{1 \pm \sqrt{1 + 4 \cdot 2}}{2} = \frac{1 \pm 3}{2} \begin{cases} \rightarrow x = 2 \\ \rightarrow x = -1 \end{cases}$$

$$\frac{7x - 2}{x^3 - 2x^2 - x + 2} = \frac{A}{x-1} + \frac{B}{x-2} + \frac{C}{x+1} = \frac{A(x-2)(x+1) + B(x-1)(x+1) + C(x-1)(x-2)}{(x-1)(x-2)(x+1)}$$

$$\Rightarrow 7x - 2 = A(x-2)(x+1) + B(x^2-1) + C(x-1)(x-2)$$

$$\text{Si } x = 1 \rightarrow 5 = -2A \Rightarrow A = -5/2$$

$$\text{Si } x = 2 \rightarrow 12 = 3B \Rightarrow B = 4$$

$$\text{Si } x = -1 \rightarrow -9 = 6C \Rightarrow C = -3/2$$

$$\textcircled{*} = \int \frac{-5/2}{x-1} dx + \int \frac{4}{x-2} dx + \int \frac{-3/2}{x+1} dx =$$

$$= -\frac{5}{2} \ln|x-1| + 4 \ln|x-2| - \frac{3}{2} \ln|x+1| + C$$

$$231) \int \frac{x^2}{(x-1)^3} dx = \textcircled{*}$$

$$\frac{x^2}{(x-1)^3} = \frac{A}{x-1} + \frac{B}{(x-1)^2} + \frac{C}{(x-1)^3} = \frac{A(x-1)^2 + B(x-1) + C}{(x-1)^3}$$

$$\Rightarrow x^2 = A(x-1)^2 + B(x-1) + C$$

$$\text{Si } x = 1 \longrightarrow 1 = C$$

$$\left. \begin{array}{l} \text{Si } x = 0 \longrightarrow 0 = A - B + 1 \\ \text{Si } x = 2 \longrightarrow 4 = A + B + 1 \end{array} \right\} \begin{array}{l} A - B = -1 \\ A + B = 3 \end{array}$$

$$\frac{2A = 2 \Rightarrow A = 1}{\downarrow} \\ B = 2$$

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

$$= \ln|x-1| + 2 \cdot \int (x-1)^{-2} dx + \int (x-1)^{-3} dx =$$

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

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

$$232) \int -\frac{3x-2}{(2-x)^2} dx = \int \frac{2-3x}{(2-x)^2} dx = \textcircled{4}$$

$$\frac{2-3x}{(2-x)^2} = \frac{A}{2-x} + \frac{B}{(2-x)^2} = \frac{A(2-x) + B}{(2-x)^2}$$

$$\Rightarrow 2-3x = A(2-x) + B$$

$$\text{Si } x = 2 \longrightarrow -4 = B$$

$$\text{Si } x = 1 \longrightarrow -1 = A - 4 \Rightarrow A = 3$$

$$\begin{aligned} \textcircled{*} &= \int \frac{3}{2-x} dx + \int \frac{-4}{(2-x)^2} dx = \\ &= 3(-1) \int \frac{-1}{2-x} dx + 4 \int (-1) \cdot (2-x)^{-2} dx = \\ &= -3 \ln |2-x| + 4 \cdot \frac{(2-x)^{-1}}{-1} = -3 \ln |2-x| - \frac{4}{2-x} + C' \end{aligned}$$

$$233) \int \frac{-2x^2+1}{x^3+6x^2+12x+8} dx = \textcircled{*}$$

$$x^3+6x^2+12x+8=0$$

	1	6	12	8
-2		-2	-8	-8
	1	4	4	0
-2		-2	-4	
	1	2	0	
-2		-2		
	1	0		

$$\frac{-2x^2+1}{x^3+6x^2+12x+8} = \frac{A}{x+2} + \frac{B}{(x+2)^2} + \frac{C}{(x+2)^3} = \frac{A(x+2)^2 + B(x+2) + C}{(x+2)^3}$$

$$\Rightarrow -2x^2+1 = A(x+2)^2 + B(x+2) + C$$

$$\text{Si } x = -2 \rightarrow -7 = C$$

$$\left. \begin{aligned} \text{Si } x = -1 &\rightarrow -1 = A + B - 7 \\ \text{Si } x = 0 &\rightarrow 1 = 4A + 2B - 7 \end{aligned} \right\} \begin{aligned} A + B &= 6 \\ 4A + 2B &= 8 \end{aligned}$$

$$\left. \begin{aligned} -2A - 2B &= -12 \\ 4A + 2B &= 8 \end{aligned} \right\} 2A = -4 \Rightarrow A = -2 \quad B = 8$$

$$\begin{aligned}
 \textcircled{*} &= \int \frac{-2}{x+2} dx + \int \frac{8}{(x+2)^2} dx + \int \frac{-7}{(x+2)^3} dx = \\
 &= -2 \ln|x+2| + 8 \cdot \frac{(x+2)^{-1}}{-1} - 7 \cdot \frac{(x+2)^{-2}}{-2} + C' = \\
 &= -2 \ln|x+2| - \frac{8}{x+2} + \frac{7}{2(x+2)^2} + C'
 \end{aligned}$$

$$\begin{aligned}
 234) \int \frac{x-2}{x^4} dx &= \int \frac{x}{x^4} dx - \int \frac{2}{x^4} dx = \int x^{-3} dx - \int 2x^{-4} dx = \\
 &= \frac{x^{-2}}{-2} - \frac{2x^{-3}}{-3} + C' = -\frac{1}{2x^2} + \frac{2}{3x^3} + C'
 \end{aligned}$$

$$235) \int \frac{4x^2 - 2x}{(x+2)(x-3)^2} dx = \textcircled{*}$$

$$\frac{4x^2 - 2x}{(x+2)(x-3)^2} = \frac{A}{x+2} + \frac{B}{x-3} + \frac{C}{(x-3)^2} = \frac{A(x-3)^2 + B(x+2)(x-3) + C(x+2)}{(x+2)(x-3)^2}$$

$$\Rightarrow 4x^2 - 2x = A(x-3)^2 + B(x+2)(x-3) + C(x+2)$$

$$\text{Si } x = -2 \rightarrow 20 = 25A \Rightarrow A = 4/5$$

$$\text{Si } x = 3 \rightarrow 30 = 5C \Rightarrow C = 6$$

$$\text{Si } x = 0 \rightarrow 0 = \frac{36}{5} - 6B + 12 \Rightarrow B = 16/5$$

$$\begin{aligned} \textcircled{F} &= \int \frac{4/5}{x+2} dx + \int \frac{16/5}{x-3} dx + \int \frac{6}{(x-3)^2} dx = \\ &= \frac{4}{5} \ln|x+2| + \frac{16}{5} \ln|x-3| + 6 \cdot \frac{(x-3)^{-1}}{-1} + C = \\ &= \frac{4}{5} \ln|x+2| + \frac{16}{5} \ln|x-3| - \frac{6}{x-3} + C \end{aligned}$$

236) $\int \frac{-x^2+7x}{x^3-x^2-x+1} dx = \textcircled{F}$

$x^3-x^2-x+1=0$

1	1	-1	-1	1
1	1	0	-1	-1
1	0	-1	0	0

$x^2-1=0 \rightarrow \begin{cases} x=1 \\ x=-1 \end{cases}$

$$\frac{-x^2+7x}{x^3-x^2-x+1} = \frac{A}{x+1} + \frac{B}{x-1} + \frac{C}{(x-1)^2} = \frac{A(x-1)^2 + B(x+1)(x-1) + C(x+1)}{(x+1)(x-1)^2}$$

$$-x^2+7x = A(x-1)^2 + B(x^2-1) + C(x+1)$$

Si $x=1 \rightarrow 6 = 2C \Rightarrow C=3$

Si $x=-1 \rightarrow -8 = 4A \Rightarrow A=-2$

Si $x=0 \rightarrow 0 = -2 - B + 3 \Rightarrow B=1$

$$\begin{aligned} \textcircled{F} &= \int \frac{-2}{x+1} dx + \int \frac{1}{x-1} dx + \int \frac{3}{(x-1)^2} dx = \\ &= -2 \ln|x+1| + \ln|x-1| - \frac{3}{x-1} + C \end{aligned}$$

$$237) \int \frac{2}{x^2+1} dx = 2 \arctg(x) + C$$

$$238) \int -\frac{3x-2}{2+x^2} dx = \int \frac{2-3x}{2+x^2} dx = \int \frac{2 dx}{2+x^2} - \int \frac{3x}{2+x^2} dx =$$

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

$$= \sqrt{2} \int \frac{1/\sqrt{2}}{4 + \left(\frac{x}{\sqrt{2}}\right)^2} dx - \frac{3}{2} \ln|2+x^2| = \sqrt{2} \cdot \arctg\left(\frac{x}{\sqrt{2}}\right) - \frac{3}{2} \ln|2+x^2| + C$$

$$239) \int \frac{-2x^2+1}{x^3-x^2+3x-3} dx = \textcircled{?}$$

$$x^3 - x^2 + 3x - 3 = 0 \quad \begin{array}{r|rrrr} & 1 & -1 & 3 & -3 \\ 1 & & 1 & 0 & 3 \\ \hline & 1 & 0 & 3 & 0 \end{array}$$

$x^2+3 \rightarrow$ Irreducible (Imaginaria!!)

$$\frac{-2x^2+1}{x^3-x^2+3x-3} = \frac{A}{x-1} + \frac{Mx+N}{x^2+3} = \frac{A(x^2+3) + Mx(x-1) + N(x-1)}{(x-1)(x^2+3)}$$

$$\Rightarrow -2x^2+1 = A(x^2+3) + Mx(x-1) + N(x-1)$$

$$\text{Si } x=1 \longrightarrow -1 = 4A \Rightarrow A = -1/4$$

$$\text{Si } x=0 \longrightarrow 1 = -\frac{3}{4} - N \Rightarrow N = -7/4$$

$$\text{Si } x=2 \longrightarrow -7 = \frac{-7}{4} + 2M - \frac{7}{4} \Rightarrow M = -7/4$$

$$\textcircled{F} = \int \frac{-1/4}{x-1} dx + \int \frac{-7/4x - \frac{7}{4}}{x^2+3} dx =$$

$$= -\frac{1}{4} \ln|x-1| - \frac{7}{4} \int \frac{2x}{x^2+3} dx - \frac{7}{4} \int \frac{1}{x^2+3} dx =$$

$$= -\frac{1}{4} \ln|x-1| - \frac{7}{8} \ln|x^2+3| - \frac{7}{12} \int \frac{1/\sqrt{3}}{1 + (\frac{x}{\sqrt{3}})^2} dx =$$

$$= -\frac{1}{4} \ln|x-1| - \frac{7}{8} \ln|x^2+3| - \frac{7\sqrt{3}}{12} \cdot \arctg\left(\frac{x}{\sqrt{3}}\right) + C'$$

$$240) \int \frac{x-2}{x^2(x^2+1)} dx = \textcircled{F}$$

$$\frac{x-2}{x^2(x^2+1)} = \frac{A}{x} + \frac{B}{x^2} + \frac{Mx+N}{x^2+1} = \frac{Ax(x^2+1) + B(x^2+1) + Mx^3 + Nx^2}{x^2(x^2+1)}$$

$$\Rightarrow x-2 = Ax(x^2+1) + B(x^2+1) + Mx^3 + Nx^2$$

$$\text{Si } x=0 \rightarrow -2 = B$$

$$\left. \begin{array}{l} \text{Si } x=1 \rightarrow -1 = 2A - 4 + M + N \\ \text{Si } x=-1 \rightarrow -3 = -2A - 4 - M + N \\ \text{Si } x=2 \rightarrow 0 = 10A - 10 + 8M + 4N \end{array} \right\} \begin{array}{l} 2A + M + N = 3 \\ -2A - M + N = 1 \\ 10A + 8M + 4N = 10 \end{array}$$

$$\begin{array}{l} \text{Ecuación 1} \\ + \\ \text{Ecuación 2} \end{array} \Rightarrow 2N = 4 \Rightarrow N = 2$$

$$\left. \begin{array}{l} \text{Ecuación 1} \\ \text{Ecuación 3} \end{array} \right\} \Rightarrow \begin{array}{l} 2A + M = 1 \\ 10A + 8M = 2 \end{array} \left\} \begin{array}{l} -10A - 5M = -5 \\ 10A + 8M = 2 \\ \hline 3M = -3 \\ \Downarrow \\ M = -1 \\ \uparrow \\ A = 1 \end{array}$$

$$\textcircled{*} = \int \frac{1}{x} dx + \int \frac{-2}{x^2} dx + \int \frac{-x+2}{x^2+1} dx =$$

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

$$= \ln|x| + \frac{2}{x} - \frac{1}{2} \ln|x^2+1| + 2 \operatorname{arctg}(x) + C'$$

$$241) \int \frac{2x^4}{(x-1)^3} dx = \textcircled{*}$$

$$(x-1)^3 = x^3 - 3x^2 + 3x - 1$$

$$\begin{array}{r} 2x^4 + 0x^3 + 0x^2 + 0x + 0 \quad | \quad x^3 - 3x^2 + 3x - 1 \\ -2x^4 + 6x^3 - 6x^2 + 2x \quad | \quad 2x + 6 \\ \hline 6x^3 - 6x^2 + 2x + 0 \\ -6x^3 + 18x^2 - 18x + 6 \\ \hline 12x^2 - 16x + 6 \end{array}$$

$$\textcircled{*} = \int (2x+6)dx + \int \frac{12x^2-16x+6}{(x-1)^3} dx = \text{😊}$$

da laresenos a parte

$$\frac{12x^2-16x+6}{(x-1)^3} = \frac{A}{(x-1)} + \frac{B}{(x-1)^2} + \frac{C}{(x-1)^3} = \frac{A(x-1)^2 + B(x-1) + C}{(x-1)^3}$$

$$\Rightarrow 12x^2 - 16x + 6 = A(x-1)^2 + B(x-1) + C$$

$$\text{Si } x=1 \rightarrow 2 = C$$

$$\text{Si } x=0 \rightarrow 6 = A - B + 2$$

$$\text{Si } x=2 \rightarrow 22 = A + B + 2$$

$$\Rightarrow \left. \begin{array}{l} A - B = 4 \\ A + B = 20 \end{array} \right\}$$

$$2A = 24 \Rightarrow A = 12$$

$$\Downarrow \\ B = 8$$

$$\int \frac{12x^2 - 16x + 6}{(x-1)^3} dx = \int \frac{12}{x-1} dx + \int \frac{8}{(x-1)^2} dx + \int \frac{2}{(x-1)^3} dx =$$

$$= 12 \ln|x-1| + 8 \cdot \frac{(x-1)^{-1}}{-1} + 2 \cdot \frac{(x-1)^{-2}}{-2} + C =$$

$$= 12 \ln|x-1| - \frac{8}{x-1} - \frac{1}{(x-1)^2} + C$$

☺ = $x^2 + 6x + 12 \ln|x-1| - \frac{8}{x-1} - \frac{1}{(x-1)^2} + C$

242) $\int -\frac{3x^3 - 2}{(2-x)^2} dx = \int \frac{2 - 3x^3}{(2-x)^2} dx = \textcircled{*}$

$$(2-x)^2 = 4 - 4x + x^2$$

$$\begin{array}{r} -3x^3 + 0x^2 + 0x + 2 \quad | \quad x^2 - 4x + 4 \\ + 3x^3 - 12x^2 + 12x \quad -3x - 12 \\ \hline \end{array}$$

$$\swarrow -12x^2 + 12x + 2$$

$$+ 12x^2 - 48x + 48$$

$$\swarrow -36x + 50$$

$\textcircled{*} = \int (-3x - 12) dx + \int \frac{-36x + 50}{(2-x)^2} dx = \text{☺}$

La hacemos a parte

$$\frac{-36x + 50}{(2-x)^2} = \frac{A}{2-x} + \frac{B}{(2-x)^2} = \frac{A(2-x) + B}{(2-x)^2}$$

$$\Rightarrow -36x + 50 = A(2-x) + B$$


Si $x = 2 \rightarrow -22 = B$

Si $x = 1 \rightarrow 14 = A - 22 \Rightarrow A = 36$

$$\int \frac{-36x + 50}{(2-x)^2} dx = \int \frac{36}{2-x} dx + \int \frac{-22}{(2-x)^2} dx =$$

$$= (-1) \cdot 36 \int \frac{-1}{2-x} dx + 22 \int (-1) \cdot (2-x)^{-2} dx =$$

$$= -36 \ln |2-x| + 22 \cdot \frac{(2-x)^{-1}}{-1} + C$$



$$= -\frac{3x^2}{2} - 12x - 36 \ln |2-x| - \frac{22}{2-x} + C'$$

243) $\int \frac{-2x^5 + 1}{x^4 - 2x^2 + 1} dx = \textcircled{*}$

$$x^4 - 2x^2 + 1 = 0 \rightarrow t^2 - 2t + 1 = 0$$

$$x^2 = t$$

$$x^4 = (x^2)^2 = t^2$$

$$t = \frac{2 \pm \sqrt{4-4}}{2} = 1$$

$x = 1$ (Doble)

$x = -1$ (Doble)

$$\begin{array}{r} -2x^5 + 0x^4 + 0x^3 + 0x^2 + 0x + 1 \\ +2x^5 \qquad -4x^3 \qquad +2x \\ \hline -4x^3 + 2x + 1 \end{array} \quad \begin{array}{l} | x^4 - 2x^2 + 1 \\ -2x \end{array}$$

$$\textcircled{*} = \int (-2x) dx + \int \frac{-4x^3 + 2x + 1}{(x-1)^2(x+1)^2} dx = \text{😊}$$

La hacemos a parte

$$\frac{-4x^3 + 2x + 1}{(x-1)^2(x+1)^2} = \frac{A}{x-1} + \frac{B}{(x-1)^2} + \frac{C}{x+1} + \frac{D}{(x+1)^2} =$$

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

$$\Rightarrow -4x^3 + 2x + 1 = A(x-1)(x+1)^2 + B(x+1)^2 + C(x-1)^2(x+1) + D(x-1)^2$$

$$\text{Si } x=1 \rightarrow -1 = 4B \Rightarrow B = -1/4$$

$$\text{Si } x=-1 \rightarrow 3 = 4D \Rightarrow D = 3/4$$

$$\left. \begin{array}{l} \text{Si } x=0 \rightarrow 1 = -A - 1/4 + C + 3/4 \\ \text{Si } x=2 \rightarrow -27 = 9A - 9/4 + 3C + 3/4 \end{array} \right\} \begin{array}{l} -A + C = 1/2 \\ 9A + 3C = -51/2 \end{array}$$

$$\left. \begin{array}{l} -9A + 9C = 9/2 \\ 9A + 3C = -51/2 \end{array} \right\} 12C = -21 \Rightarrow C = -21/12 \Rightarrow A = -9/4$$

$$\int \frac{-4x^3 + 2x + 1}{(x-1)^2(x+1)^2} dx = \int \frac{-9/4}{x-1} dx + \int \frac{-1/4}{(x-1)^2} dx + \int \frac{-21/12}{x+1} dx + \int \frac{3/4}{(x+1)^2} dx$$

$$= -\frac{9}{4} \ln|x-1| - \frac{1}{4} \frac{(x-1)^{-1}}{-1} - \frac{21}{12} \ln|x+1| + \frac{3}{4} \frac{(x+1)^{-1}}{-1} =$$

$$= -\frac{9}{4} \ln|x-1| + \frac{1}{4(x-1)} - \frac{21}{12} \ln|x+1| - \frac{3}{4(x+1)}$$

$$\text{😊} = -x^2 - \frac{9}{4} \ln|x-1| - \frac{21}{12} \ln|x+1| + \frac{-2x+4}{4(x^2-1)} + C'$$

$$244) \int \frac{x^6 - 1}{x^2(x^2+1)(x-1)} dx = \int \frac{\cancel{(x-1)}(x^5+x^4+x^3+x^2+x+1)}{x^2(x^2+1)\cancel{(x-1)}} dx =$$

	1	0	0	0	0	0	-1
Δ		1	1	1	1	1	1
	1	1	1	1	1	1	0

$$= \int \frac{x^5+x^4+x^3+x^2+x+1}{x^4+x^2} dx = *$$

$$\begin{array}{r} x^5+x^4+x^3+x^2+x+1 \quad | \quad x^4+x^2 \\ -x^5 \qquad \qquad -x^3 \\ \hline x^4 \qquad \qquad +x^2+x+1 \\ -x^4 \qquad \qquad -x^2 \\ \hline \qquad \qquad \qquad x+1 \end{array}$$

$$* = \int (x+1) dx + \int \frac{x+1}{x^2(x^2+1)} dx = \text{😊}$$

↙ La hacemos a parte

$$\frac{x+1}{x^2(x^2+1)} = \frac{A}{x} + \frac{B}{x^2} + \frac{Mx+N}{x^2+1} = \frac{Ax(x^2+1) + B(x^2+1) + Mx^3 + Nx^2}{x^2(x^2+1)}$$

$$\Rightarrow x+1 = Ax(x^2+1) + B(x^2+1) + Mx^3 + Nx^2$$

$$\text{Si } x=0 \rightarrow 1 = B$$

$$\text{Si } x=1 \rightarrow 2 = 2A + 2 + M + N$$

$$\text{Si } x=-1 \rightarrow 0 = -2A + 2 - M + N$$

$$\text{Si } x=2 \rightarrow 3 = 10A + 5 + 8M + 4N$$

$$\left. \begin{array}{l} 2A + M + N = 0 \\ -2A - M + N = -2 \\ 10A + 8M + 4N = -2 \end{array} \right\}$$

$$\left. \begin{array}{l} \text{Ecuación 1} \\ + \\ \text{Ecuación 2} \end{array} \right\} \Rightarrow 2N = -2 \Rightarrow N = -1$$

$$\left. \begin{array}{l} \text{Ecuación 1} \\ \text{Ecuación 3} \end{array} \right\} \begin{array}{l} 2A + M = 1 \\ 10A + 8M = 2 \end{array} \left\} \begin{array}{l} -10A - 5M = -5 \\ 10A + 8M = 2 \end{array} \right\}$$

$$\Delta \quad \frac{3M = -3 \Rightarrow M = -1}{A = 1}$$

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

$$= \ln|x| - \frac{1}{x} - \frac{1}{2} \int \frac{2x}{x^2+1} dx - \int \frac{1}{x^2+1} dx =$$

$$= \ln|x| - \frac{1}{x} - \frac{1}{2} \ln|x^2+1| - \arctg(x)$$

$$\text{😊} = \frac{x^2}{2} + x + \ln|x| - \frac{1}{x} - \frac{1}{2} \ln|x^2+1| - \operatorname{arctg}|x| + C$$

$$245) \int x \cdot 2^{x^2-3} dx = \frac{1}{2} \int 2x \cdot 2^{x^2-3} dx = \frac{1}{2} \cdot \frac{2^{x^2-3}}{\ln 2} = \frac{2^{x^2-4}}{\ln 2} + C$$

$$246) \int \frac{\ln^3 x}{2x} dx = \frac{1}{2} \int \frac{1}{x} \cdot (\ln x)^3 dx = \frac{1}{2} \cdot \frac{(\ln x)^4}{4} + C$$

$$247) \int \underbrace{x \cdot \ln(1+x^2)}_{dv} dx = \frac{x^2}{2} \ln(1+x^2) - \int \frac{x^3}{1+x^2} dx = \textcircled{*}$$

$$u = \ln(1+x^2) \quad du = \frac{2x}{1+x^2} dx \quad \left| \begin{array}{l} x^3 \\ -x^3 - x \\ -x \end{array} \right| \quad \frac{x^2+1}{x}$$

$$dv = x \cdot dx \quad v = \frac{x^2}{2}$$

$$\textcircled{*} = \frac{x^2}{2} \ln(1+x^2) - \left[\int x dx - \frac{1}{2} \int \frac{2x}{1+x^2} dx \right] =$$

$$= \frac{x^2}{2} \ln(1+x^2) - \frac{x^2}{2} + \frac{1}{2} \ln(1+x^2) + C$$

$$248) \int \frac{1}{e^x + e^{-x}} dx = \int \frac{1}{e^x + \frac{1}{e^x}} dx = \int \frac{1}{\frac{(e^x)^2 + 1}{e^x}} dx$$

$$= \int \frac{e^x}{1 + (e^x)^2} dx = \operatorname{arctg}(e^x) + C'$$

$$249) \int \frac{x^2 + 2}{\sqrt{x^3 + 6x}} dx = \frac{1}{3} \int 3(x^2 + 2) \cdot (x^3 + 6x)^{-1/3} dx = \frac{1}{3} \cdot \frac{(x^3 + 6x)^{2/3}}{2/3} + C' =$$

$$= \frac{1}{2} \sqrt[3]{(x^3 + 6x)^2} + C'$$

$$250) \int \frac{x}{1 + x^4} dx = \frac{1}{2} \int \frac{2x}{1 + (x^2)^2} dx = \frac{1}{2} \operatorname{arctg}(x^2) + C'$$

$$251) \int \frac{\operatorname{arctg}(x)}{1 + x^2} dx = \int \frac{1}{1 + x^2} \cdot \operatorname{arctg}(x) dx = \frac{(\operatorname{arctg} x)^2}{2} + C'$$

$$252) \int \frac{dx}{(\operatorname{arcsen} x)^5 \cdot \sqrt{1 + x^2}} = \int \frac{1}{\sqrt{1 + x^2}} \cdot (\operatorname{arcsen} x)^{-5} dx = \frac{(\operatorname{arcsen} x)^{-4}}{-4} + C'$$

$$\begin{aligned}
 253) \int \operatorname{sen}^5 x \cdot \cos^2 x \, dx &= \int \operatorname{sen} x \cdot \operatorname{sen}^2 x \cdot \operatorname{sen}^2 x \cdot \cos^2 x \, dx = \\
 &= \int \operatorname{sen} x \cdot (1 - \cos^2 x) \cdot (1 - \cos^2 x) \cdot \cos^2 x \, dx = \\
 &= \int \operatorname{sen} x \cdot (1 - 2\cos^2 x + \cos^4 x) \cdot \cos^2 x \, dx = \\
 &= - \int -\operatorname{sen} x \cdot \cos^2 x \, dx + 2 \int -\operatorname{sen} x \cdot \cos^4 x \, dx + (-1) \int -\operatorname{sen} x \cdot \cos^6 x \, dx = \\
 &= -\frac{\cos^3 x}{3} + 2\frac{\cos^5 x}{5} - \frac{\cos^7 x}{7} + C
 \end{aligned}$$

$$\begin{aligned}
 254) \int \sqrt{4-x^2} \, dx &= \int \sqrt{4 - (2\operatorname{sen} t)^2} \cdot 2\cos t \, dt = \\
 x &= 2\operatorname{sen} t \\
 dx &= 2\cos t \, dt \quad \Bigg| \int \sqrt{4(1 - \operatorname{sen}^2 t)} \cdot 2\cos t \, dt = \\
 &= \int 2\sqrt{\cos^2 t} \cdot 2\cos t \, dt = \int 4\cos^2 t \, dt = \int (2 + 2\cos(2t)) \, dt = \\
 &\quad \begin{array}{l} \cos^2 t + \operatorname{sen}^2 t = 1 \\ \cos^2 t - \operatorname{sen}^2 t = \cos(2t) \\ \hline 2\cos^2 t = 1 + \cos(2t) \end{array} \\
 &= 2t + \operatorname{sen}(2t) = 2t + 2\operatorname{sen} t \cos t = 2\operatorname{arcsen}\left(\frac{x}{2}\right) + x \cdot \sqrt{1 - \frac{x^2}{4}} = \\
 &\quad \operatorname{sen}(2t) = 2\operatorname{sen} t \cos t \\
 &= 2\operatorname{arcsen}\left(\frac{x}{2}\right) + \frac{x}{2} \cdot \sqrt{4-x^2} + C
 \end{aligned}$$

$$255) \int \operatorname{sen}^2 x \, dx = \int \frac{1 - \cos(2x)}{2} \, dx = \int \frac{1}{2} \, dx - \frac{1}{2} \cdot \frac{1}{2} \int 2 \cos(2x) \, dx$$

$$\cos^2 x + \operatorname{sen}^2 x = 1$$

$$\cos^2 x - \operatorname{sen}^2 x = \cos(2x)$$

Restando: $2 \operatorname{sen}^2 x = 1 - \cos(2x)$

↓

$$\operatorname{sen}^2 x = \frac{1 - \cos(2x)}{2}$$

$$= \frac{x}{2} - \frac{1}{4} \operatorname{sen}(2x) + C'$$

$$256) \int \frac{\sqrt{2-x^2}}{4} \, dx = \frac{1}{4} \int \sqrt{2-x^2} \, dx = \frac{1}{4} \int \sqrt{2-2 \operatorname{sen}^2 t} \cdot \sqrt{2} \cdot \cos t \, dt$$

$$\left. \begin{aligned} x &= \sqrt{2} \operatorname{sen} t \\ dx &= \sqrt{2} \cdot \cos t \, dt \end{aligned} \right\}$$

$$= \frac{1}{4} \int \sqrt{2} \cdot \sqrt{1-\operatorname{sen}^2 t} \cdot \sqrt{2} \cdot \cos t \, dt = \frac{1}{4} \int 2 \cos^2 t \, dt = \frac{1}{2} \int \cos^2 t \, dt =$$

$$\cos^2 t + \operatorname{sen}^2 t = 1$$

$$\cos^2 t - \operatorname{sen}^2 t = \cos(2t)$$

$$\cos^2 t = \frac{1 + \cos(2t)}{2}$$

$$= \frac{1}{2} \int \frac{1 + \cos(2t)}{2} \, dt =$$

$$= \frac{1}{4} \left[t + \frac{1}{2} \operatorname{sen}(2t) \right] = \frac{1}{4} \left[t + \frac{1}{2} 2 \operatorname{sen} t \cos t \right] =$$

$$= \frac{1}{4} \left[\operatorname{arc} \operatorname{sen} \left(\frac{x}{\sqrt{2}} \right) + \frac{x}{\sqrt{2}} \cdot \frac{\sqrt{1-x^2}}{2} \right] + C'$$

$$257) \int (2x-3) dx = x^2 + 3x + C$$

$$258) \int (3x^2 + 4x - 2) dx = x^3 + 2x^2 - 2x + C$$

$$259) \int \left(\frac{3}{4} x^3 - 3x^2 + 6x - 1 \right) dx = \frac{3x^4}{16} - x^3 + 3x^2 - x + C$$

$$260) \int \frac{7}{\operatorname{sen}^2(3x)} dx = 7 \cdot \frac{-1}{3} \int -3 \operatorname{cosec}^2(3x) dx = -\frac{7}{3} \operatorname{cotg}(3x) + C$$

Ojo! $\rightarrow \frac{1}{\operatorname{sen}^2 x} = \operatorname{cosec}^2(x)$; $f(x) = \operatorname{cotg}(x) \rightarrow f'(x) = -\operatorname{cosec}^2(x)$

$$261) \int 3 \sec^2\left(\frac{1}{5}x\right) dx = 3 \cdot 5 \int \frac{1}{5} \sec^2\left(\frac{1}{5}x\right) dx = 15 \operatorname{tg}\left(\frac{1}{5}x\right) + C$$

Ojo! $\rightarrow f(x) = \operatorname{tg}(x) \rightarrow f'(x) = \frac{1}{\cos^2 x} = \sec^2 x$

$$262) \int \frac{2x + \sqrt{x}}{x^2} dx = \int \frac{2x}{x^2} dx + \int \frac{\sqrt{x}}{x^2} dx = 2 \ln|x| + \int x^{-3/2} dx$$

$$= 2 \ln|x| + \frac{x^{-1/2}}{-1/2} = 2 \ln|x| - \frac{2}{\sqrt{x}} + C$$

$$263) \int \frac{1 - \operatorname{sen} x}{2x + 2\cos x} dx = \frac{1}{2} \int \frac{2(1 - \operatorname{sen} x)}{2x + 2\cos x} dx = \frac{1}{2} \ln|2x + 2\cos x| + C$$

$$264) \int \ln\left(\frac{x+1}{x-1}\right)^x dx = \int \underbrace{x \cdot \ln\left(\frac{x+1}{x-1}\right)}_u dx = \textcircled{*}$$

$$u = \ln\left(\frac{x+1}{x-1}\right) \quad du = \frac{1}{\frac{x+1}{x-1}} \cdot \frac{1(x-1) - (x+1) \cdot 1}{(x-1)^2} = \frac{-2}{x^2-1} dx$$

$$dv = x dx \quad v = \frac{x^2}{2}$$

$$\textcircled{*} = \frac{x^2}{2} \ln\left(\frac{x+1}{x-1}\right) + \int \frac{x^2}{x^2-1} dx = \frac{x^2}{2} \ln\left(\frac{x+1}{x-1}\right) + \int 1 dx + \int \frac{1}{x^2-1} dx =$$

$$\frac{x^2}{-x^2+1} \left| \frac{x^2-1}{1} \right| \left| \frac{1}{x^2-1} = \frac{A}{x+1} + \frac{B}{x-1} = \frac{A(x-1)+B(x+1)}{(x+1)(x-1)} \right.$$

$$\Rightarrow 1 = A(x-1) + B(x+1)$$

$$\text{Si } x=1 \Rightarrow 1=2B \Rightarrow B=1/2$$

$$\text{Si } x=-1 \Rightarrow 1=-2A \Rightarrow A=-1/2$$

$$\textcircled{*} = \frac{x^2}{2} \ln\left(\frac{x+1}{x-1}\right) + x + \int \frac{-1/2}{x+1} dx + \int \frac{1/2}{x-1} dx =$$

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

$$265) \int x \cdot (\ln x)^2 dx = \frac{x^2}{2} (\ln x)^2 - \int x \ln x dx = \textcircled{*}$$

$$u = (\ln x)^2 \quad du = \frac{2 \ln x}{x} dx \quad \parallel \quad u = \ln x \quad du = \frac{1}{x} dx$$

$$dv = x dx \quad v = \frac{x^2}{2} \quad \parallel \quad dv = x dx \quad v = \frac{x^2}{2}$$

$$\textcircled{*} = \frac{x^2}{2} (\ln x)^2 - \left[\frac{x^2}{2} \ln x - \int \frac{x}{2} dx \right] =$$

$$= \frac{x^2}{2} (\ln x)^2 - \frac{x^2}{2} \ln x + \frac{x^2}{4} + C$$

$$266) \int x \cdot \arctg(x+1) dx = \frac{x^2}{2} \arctg(x+1) - \int \frac{x^2}{2x^2+4x+4} dx = \textcircled{*}$$

$$u = \arctg(x+1) \quad du = \frac{1}{1+(x+1)^2} dx = \frac{1}{x^2+2x+2} dx$$

$$dv = x dx \quad v = \frac{x^2}{2}$$

$$\begin{array}{r|l} \begin{array}{r} x^2 + 0x + 0 \\ -x^2 - 2x - 2 \\ \hline -2x - 2 \end{array} & \left| \frac{2x^2+4x+4}{1/2} \right| \end{array} \quad \parallel \quad \textcircled{*} = \frac{x^2}{2} \arctg(x+1) - \int \frac{1}{2} dx + \int \frac{2x+2}{2x^2+4x+4} dx$$

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

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

$$267) \int \frac{x \cdot \arcsen(x)}{\sqrt{1-x^2}} dx = -\sqrt{1-x^2} \cdot \arcsen(x) + \int 1 dx = \textcircled{*}$$

$$u = \arcsen(x) \quad du = \frac{1}{\sqrt{1-x^2}} dx$$

$$dv = \frac{x}{\sqrt{1-x^2}} dx \quad v = -\sqrt{1-x^2}$$

$$\textcircled{*} = -\sqrt{1-x^2} \cdot \arcsen(x) + x + C'$$

$$268) \int \frac{\sqrt{1+\sqrt{x}}}{\sqrt{x}} dx = \int \sqrt{t^2} \cdot 4t dt = \int 4t^2 dt = \frac{4t^3}{3} + k =$$

$$\begin{array}{l} 1+\sqrt{x} = t^2 \\ \frac{1}{2\sqrt{x}} dx = 2t dt \\ \frac{dx}{\sqrt{x}} = 4t dt \end{array} \left| \right. = \frac{4}{3} \sqrt{(1+\sqrt{x})^3} + C'$$

$$269) \int \frac{x^4}{\sqrt{1-x^{10}}} dx = \frac{1}{5} \int \frac{5x^4 dx}{\sqrt{1-(x^5)^2}} = \frac{1}{5} \arcsen(x^5) + C'$$

$$\begin{aligned} 270) \int e^x \cdot \sqrt{(e^x+1)^3} dx &= \int e^x \cdot (e^x+1)^{3/2} dx = \\ &= \frac{(e^x+1)^{5/2}}{5/2} + C' = \frac{2}{5} \sqrt{(e^x+1)^5} + C' \end{aligned}$$

$$\begin{aligned}
 271) \int \cos^3 x \cdot \operatorname{sen}^5 x \, dx &= \int \cos x \cdot \cos^2 x \cdot \operatorname{sen}^5 x \, dx = \\
 &= \int \cos x (1 - \operatorname{sen}^2 x) \cdot \operatorname{sen}^5 x \, dx = \int \cos x (\operatorname{sen}^5 x - \operatorname{sen}^7 x) \, dx = \\
 &= \int \cos x \cdot \operatorname{sen}^5 x \, dx - \int \cos x \cdot \operatorname{sen}^7 x \, dx = \frac{\operatorname{sen}^6 x}{6} - \frac{\operatorname{sen}^8 x}{8} + C
 \end{aligned}$$

$$\begin{aligned}
 272) \int \operatorname{sen}^3 x \cdot \cos^{15} x \, dx &= \int \operatorname{sen} x \cdot \operatorname{sen}^2 x \cdot \cos^{15} x \, dx = \\
 &= \int \operatorname{sen} x \cdot (1 - \cos^2 x) \cdot \cos^{15} x \, dx = \int \operatorname{sen} x (\cos^{15} x - \cos^{17} x) \, dx = \\
 &= - \int -\operatorname{sen} x \cos^{15} x \, dx + \int -\operatorname{sen} x \cos^{17} x \, dx = \\
 &= - \frac{\cos^{16} x}{16} + \frac{\cos^{18} x}{18} + C
 \end{aligned}$$

$$\begin{aligned}
 273) \int \frac{\operatorname{sen}^3 x}{\cos^2 x} \, dx &= \int \frac{\operatorname{sen} x \cdot \operatorname{sen}^2 x}{\cos^2 x} \, dx = \int \frac{\operatorname{sen} x \cdot (1 - \cos^2 x)}{\cos^2 x} \, dx = \\
 &= \int \frac{\operatorname{sen} x - \operatorname{sen} x \cdot \cos^2 x}{\cos^2 x} \, dx = \int \frac{\operatorname{sen} x}{\cos^2 x} \, dx - \int \frac{\operatorname{sen} x \cdot \cancel{\cos^2 x}}{\cos^2 x} \, dx = \\
 &= - \int -\operatorname{sen} x \cdot (\cos x)^{-2} \, dx - \int \operatorname{sen} x \, dx = - \frac{(\cos x)^{-1}}{-1} + \cos x = \\
 &= \frac{1}{\cos x} + \cos x + C
 \end{aligned}$$

$$274) \int \frac{1}{\cos^3 x \operatorname{sen} x} dx = \int \frac{\operatorname{sen}^2 x + \cos^2 x}{\cos^3 x \operatorname{sen} x} dx =$$

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

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

$$= - \frac{(\cos x)^{-2}}{-2} + \int \frac{1/\cos^2 x}{\operatorname{tg} x} dx = \frac{1}{2 \cos^2 x} + \operatorname{ar} |\operatorname{tg} x| + C$$

$$275) \int \operatorname{tg}^3 x \cdot \sec^3 x dx = \int \frac{\operatorname{sen}^3(x)}{\cos^3(x)} \cdot \frac{1}{\cos^3(x)} dx = \int \frac{\operatorname{sen}^3(x) dx}{\cos^6(x)} =$$

$$= \int \operatorname{sen}(x) \cdot \operatorname{sen}^2(x) \cdot \cos^{-6}(x) dx = \int \operatorname{sen}(x) \cdot (1 - \cos^2(x)) \cdot \cos^{-6}(x) dx =$$

$$= - \int -\operatorname{sen}(x) \cdot \cos^{-6}(x) dx + \int -\operatorname{sen}(x) \cdot \cos^{-4}(x) dx =$$

$$= - \frac{\cos^{-5}(x)}{-5} + \frac{\cos^{-3}(x)}{-3} + C = \frac{1}{5 \cos^5(x)} - \frac{1}{3 \cos^3(x)} + C$$

$$276) \int \frac{\cos x}{\operatorname{sen} x + \cos x} dx = \int \frac{\cos x + \operatorname{sen} x - \operatorname{sen} x}{\operatorname{sen} x + \cos x} dx =$$

$$= \int \frac{\cos x + \operatorname{sen} x}{\operatorname{sen} x + \cos x} dx + \int \frac{-\operatorname{sen} x + \cos x - \cos x}{\operatorname{sen} x + \cos x} dx =$$

$$= \int 1 dx + \int \frac{\cos x - \operatorname{sen} x}{\operatorname{sen} x + \cos x} dx - \int \frac{\cos x}{\operatorname{sen} x + \cos x} dx =$$

$$= x + \ln |\operatorname{sen} x + \cos x| - \int \frac{\cos x}{\operatorname{sen} x + \cos x} dx = I$$

$$\Rightarrow 2I = x + \ln |\operatorname{sen} x + \cos x|$$

$$\Rightarrow \int \frac{\cos x}{\operatorname{sen} x + \cos x} dx = \frac{1}{2} [x + \ln |\operatorname{sen} x + \cos x|] + C$$

$$277) \int \frac{\cos x}{2 \operatorname{sen} x \cos^2 x + \operatorname{sen}^3 x} dx = \int \frac{dt}{2t(1-t^2) + t^3} = \textcircled{*}$$

$$\operatorname{sen} x = t \rightarrow \cos^2 x = 1 - \operatorname{sen}^2 x = 1 - t^2$$

$$\cos x dx = dt$$

$$\textcircled{*} = \int \frac{dt}{2t - 2t^3 + t^3} = \int \frac{dt}{2t - t^3} = \textcircled{**}$$

$$2t - t^3 = 0 \Rightarrow t(2 - t^2) = 0 \begin{cases} \rightarrow t = 0 \\ \rightarrow 2 - t^2 = 0 \end{cases} \begin{cases} \rightarrow t = \sqrt{2} \\ \rightarrow t = -\sqrt{2} \end{cases}$$

$$\frac{1}{2t - t^3} = \frac{A}{t} + \frac{B}{\sqrt{2} - t} + \frac{C}{\sqrt{2} + t} = \frac{A(2 - t^2) + Bt(\sqrt{2} + t) + Ct(\sqrt{2} - t)}{t(\sqrt{2} - t)(\sqrt{2} + t)}$$

$$\Rightarrow 1 = A(2 - t^2) + Bt(\sqrt{2} + t) + Ct(\sqrt{2} - t)$$

$$\text{Si } t = 0 \Rightarrow 1 = 2A \Rightarrow A = 1/2$$

$$\text{Si } t = \sqrt{2} \Rightarrow 1 = 4B \Rightarrow B = 1/4$$

$$\text{Si } t = -\sqrt{2} \Rightarrow 1 = -4C \Rightarrow C = -1/4$$

$$\textcircled{4} = \int \frac{1/2}{t} dt + \int \frac{-1/4}{\sqrt{2} - t} dt + \int \frac{-1/4}{\sqrt{2} + t} dt =$$

$$= \frac{1}{2} \ln |t| - \frac{1}{4} \ln |\sqrt{2} - t| - \frac{1}{4} \ln |\sqrt{2} + t| + K =$$

$$= \frac{1}{2} \ln |\sec x| - \frac{1}{4} \ln |\sqrt{2} - \sec x| - \frac{1}{4} \ln |\sqrt{2} + \sec x| + C =$$

$$= \frac{1}{2} \ln |\sec x| - \frac{1}{4} \left[\ln |\sqrt{2} - \sec x| + \ln |\sqrt{2} + \sec x| \right] + C =$$

$$= \frac{1}{2} \ln |\sec x| - \frac{1}{4} \ln [(\sqrt{2} - \sec x)(\sqrt{2} + \sec x)] + C =$$

$$= \frac{1}{2} \ln |\sec x| - \frac{1}{4} \ln (2 - \sec^2 x) = \frac{1}{2} \ln |\sec x| - \frac{1}{4} \ln |1 + \cos^2 x| + C$$

$$278) \int \frac{1 + \sqrt{x+1}}{1 + \sqrt[3]{x+1}} dx = \int \frac{1 + \sqrt{t^6}}{1 + \sqrt[3]{t^6}} \cdot 6t^5 dt =$$

$$x+1 = t^6 \quad || \quad dx = 6t^5 dt \quad || \quad = \int \frac{1 + t^3}{1 + t^2} \cdot 6t^5 dt =$$

$$= \int \frac{6t^8 + 6t^5}{1 + t^2} dt = \textcircled{*}$$

$$\begin{array}{r} 6t^8 + 0t^7 + 0t^6 + 6t^5 + 0t^4 + 0t^3 + 0t^2 + 0t + 0 \quad | \quad t^2 + 1 \\ -6t^8 \qquad \qquad -6t^6 \\ \hline -6t^6 + 6t^5 + 0t^4 \\ +6t^6 \qquad \qquad +6t^4 \\ \hline 6t^5 + 6t^4 + 0t^3 \\ -6t^5 \qquad -6t^3 \\ \hline 6t^4 - 6t^3 + 0t^2 \\ -6t^4 \qquad -6t^2 \\ \hline -6t^3 - 6t^2 + 0t \\ +6t^3 \qquad +6t \\ \hline -6t^2 + 6t + 0 \\ +6t^2 \qquad +6 \\ \hline 6t + 6 \end{array}$$

$$\textcircled{*} = \int (6t^6 - 6t^4 + 6t^3 + 6t^2 - 6t - 6) dt + \int \frac{6t + 6}{1 + t^2} dt =$$

$$= \frac{6t^7}{7} - \frac{6t^5}{5} + \frac{6t^4}{4} + \frac{6t^3}{3} - \frac{6t^2}{2} - 6t + \frac{6}{2} \int \frac{2t}{1+t^2} dx + 6 \int \frac{1}{1+t^2} dt$$

$$= \frac{6}{7} t^7 - \frac{6}{5} t^5 + \frac{3}{2} t^4 + 2t^3 - 3t^2 - 6t + 3 \operatorname{lee} |1+t^2| + 6 \operatorname{arctg}(t) + k =$$

$$= \frac{6}{7} \sqrt[6]{(x+1)^7} - \frac{6}{5} \sqrt[6]{(x+1)^5} + \frac{3}{2} \sqrt[6]{(x+1)^4} + 2 \sqrt[6]{(x+1)^3} - 3 \sqrt[6]{(x+1)^2} -$$

$$- 6 \sqrt[6]{x+1} + 3 \operatorname{lee} |1 + \sqrt[6]{(x+1)^2}| + 6 \operatorname{arctg}(\sqrt[6]{x+1}) + C'$$

$$279) \int \frac{1+x+\sqrt{x+1}}{(x+1) \cdot \sqrt[3]{x+1}} dx = \int \frac{t^6 + \sqrt{t^6}}{t^6 \cdot \sqrt[3]{t^6}} \cdot 6t^5 dt =$$

$$x+1 = t^6 \quad || \quad dx = 6t^5 \cdot dt \quad || \quad = \int \frac{t^6 + t^3}{t^{\cancel{3}^3}} \cdot \cancel{6} t^{\cancel{5}^3} dt =$$

$$= \int \frac{\cancel{t^3} (t^3 + 1)}{\cancel{t^3}} \cdot 6 \cdot dt = \int (6t^3 + 6) dt = \frac{6t^4}{4} + 6t + k =$$

$$= \frac{3}{2} t^4 + 6t + k = \frac{3}{2} \sqrt[6]{(x+1)^4} + 6 \sqrt[6]{x+1} + C'$$

$$280) \int \frac{1}{(1-e^x)^2} dx = \int \frac{1}{(1-t)^2} \cdot \frac{dt}{t} = \int \frac{dt}{t(1-t)^2} = (*)$$

$$e^x = t$$

$$e^x dx = dt \rightarrow dx = \frac{dt}{e^x} = \frac{dt}{t}$$

$$\frac{1}{t(1-t)^2} = \frac{A}{t} + \frac{B}{(1-t)} + \frac{C}{(1-t)^2} = \frac{A(1-t)^2 + Bt(1-t) + Ct}{t(1-t)^2}$$

$$\Rightarrow 1 = A(1-t)^2 + Bt(1-t) + Ct$$

$$\text{Si } t=0 \Rightarrow 1 = A$$

$$\text{Si } t=1 \Rightarrow 1 = C$$

$$\text{Si } t=2 \Rightarrow 1 = 1 - 2B + 2 \Rightarrow B = 1$$

$$\begin{aligned} \textcircled{*} &= \int \frac{1}{t} dt + \int \frac{1}{1-t} dt + \int \frac{1}{(1-t)^2} dt = \\ &= \ln|t| - \ln|1-t| + (1-t)^{-1} + k = \\ &= \ln|t| - \ln|1-t| + \frac{1}{1-t} + k = \\ &= \ln e^x - \ln|1-e^x| + \frac{1}{1-e^x} + C' = \\ &= x - \ln|1-e^x| + \frac{1}{1-e^x} + C' \end{aligned}$$

$$281) \int \frac{1 + \sqrt{e^x}}{(1 - \sqrt[4]{e^x})^2} \cdot dx = \int \frac{1 + \sqrt{t^4}}{(1 - \sqrt[4]{t^4})^2} \cdot \frac{4dt}{t} = \textcircled{*}$$

$$\begin{aligned} e^x &= t^4 \\ e^x dx &= 4t^3 \cdot dt \rightarrow dx = \frac{4t^3 \cdot dt}{e^x} = \frac{4t^3 \cdot dt}{t^4} = \frac{4dt}{t} \end{aligned}$$

$$\textcircled{*} = \int \frac{(1+t^2) \cdot 4}{(1-t)^2 \cdot t} dt = \int \frac{4t^2 + 4}{t(1-t)^2} dt = \textcircled{*}$$

$$\frac{4t^2 + 4}{t(1-t)^2} = \frac{A}{t} + \frac{B}{(1-t)} + \frac{C}{(1-t)^2} = \frac{A(1-t)^2 + Bt(1-t) + Ct}{t(1-t)^2}$$

$$\Rightarrow 4t^2 + 4 = A(1-t)^2 + B \cdot t(1-t) + Ct$$

$$\text{Si } t=0 \rightarrow 4 = A$$

$$\text{Si } t=1 \rightarrow 8 = C$$

$$\text{Si } t=2 \rightarrow 20 = 4 - 2B + 16 \Rightarrow B=0$$

$$\textcircled{*} = \int \frac{4}{t} dt + \int \frac{8}{(1-t)^2} dt = 4 \ln|t| - 8 \cdot \frac{(1-t)^{-1}}{-1} + K =$$

$$= 4 \ln|t| + \frac{8}{1-t} + K = 4 \ln \sqrt[4]{e^x} + \frac{8}{1-\sqrt[4]{e^x}} + C' =$$

$$= 4 \ln (e^x)^{1/4} + \frac{8}{1-\sqrt[4]{e^x}} + C' = 4 \ln e^{1/4 x} + \frac{8}{1-\sqrt[4]{e^x}} + C' =$$

$$= 4 \cdot \frac{1}{4} x + \frac{8}{1-\sqrt[4]{e^x}} + C' = x + \frac{8}{1-\sqrt[4]{e^x}} + C'$$

$$282) \int \frac{1}{e^x + e^{-x} + 1} dx = \int \frac{1}{e^x + \frac{1}{e^x} + 1} dx = \int \frac{1}{\frac{(e^x)^2 + 1 + e^x}{e^x}} dx =$$

$$= \int \frac{e^x}{(e^x)^2 + e^x + 1} dx = \textcircled{*}$$

$$e^x = t \quad \parallel \quad \textcircled{*} = \int \frac{dt}{t^2 + t + 1} = \textcircled{*}$$

$$e^x dx = dt$$

$$t^2 + t + 1 = 0$$

$$t = \frac{-1 \pm \sqrt{1-4}}{2} = \frac{-1 \pm i\sqrt{3}}{2}$$

$$t^2 + t + 1 = \left(t + \frac{1}{2}\right)^2 + \frac{3}{4}$$

$$\textcircled{*} = \int \frac{dt}{\left(\frac{3}{4} + \left(t + \frac{1}{2}\right)^2\right)} = \frac{4\sqrt{3}}{3 \cdot 2} \int \frac{dt \cdot \frac{2}{\sqrt{3}}}{1 + \left(\frac{2(t+1/2)}{\sqrt{3}}\right)^2} =$$

$$= \frac{2\sqrt{3}}{3} \operatorname{arctg} \left(\frac{2}{\sqrt{3}} t + \frac{1}{\sqrt{3}} \right) = \frac{2\sqrt{3}}{3} \operatorname{arctg} \left(\frac{2e^x + 1}{\sqrt{3}} \right) + C$$

$$283) \int \frac{e^{3x}}{e^{2x} - 3e^x + 2} dx = \int \frac{e^{2x} \cdot e^x dx}{e^{2x} - 3e^x + 2} = \int \frac{t^2 dt}{t^2 - 3t + 2} = \textcircled{*}$$

$$e^x = t \rightarrow e^{2x} = (e^x)^2 = t^2$$

$$e^x dx = dt$$

$$\frac{t^2 + 0t + 0}{-t^2 + 3t - 2} \parallel \frac{t^2 - 3t + 2}{1} \quad \parallel \quad = \int 1 dt + \int \frac{3t - 2}{t^2 - 3t + 2} dt = \textcircled{\text{smiley}}$$

la hacemos a parte

$$t^2 - 3t + 2 = 0 \begin{cases} \rightarrow t=2 \\ \rightarrow t=1 \end{cases}$$

$$\frac{3t-2}{t^2-3t+2} = \frac{A}{t-2} + \frac{B}{t-1} = \frac{A(t-1) + B(t-2)}{(t-2)(t-1)}$$

$$\Rightarrow 3t-2 = A(t-1) + B(t-2)$$

$$\text{Si } t=1 \rightarrow 1 = -B \Rightarrow B = -1$$

$$\text{Si } t=2 \rightarrow 4 = A$$

$$\int \frac{3t-2}{t^2-3t+2} dt = \int \frac{4}{t-2} dt + \int \frac{-1}{t-1} dt = 4 \ln|t-2| - \ln|t-1| + K$$

$$\Rightarrow \text{😊} = t + 4 \ln|t-2| - \ln|t-1| + K =$$

$$= e^x + 4 \ln|e^x-2| - \ln|e^x-1| + C'$$

$$284) \int (1-x^2)^{-3/2} dx = \int (1-\sec^2 t)^{-3/2} \cdot \cos t dt =$$

$$\begin{aligned} x &= \sec t \\ dx &= \sec t \tan t dt \end{aligned} \quad \parallel \quad = \int (\cos^2 t)^{-3/2} \cdot \cos t dt =$$

$$= \int \cos^{-3} t \cdot \cos t dt = \int \cos^{-2} t dt = \int \frac{1}{\cos^2 t} dt =$$

$$= \operatorname{tg}(t) + K = \frac{x}{\sqrt{1-x^2}} + C'$$

$$\operatorname{tg}(t) = \frac{\operatorname{sen}(t)}{\cos(t)} = \frac{x}{\sqrt{1-x^2}}$$

$$285) \int (1 - (2x+1)^2)^{-1/2} dx = \int \frac{1}{\sqrt{1 - (2x+1)^2}} dx = \textcircled{*}$$

$$2x+1 = \operatorname{sen} t$$

$$2dx = \cos t dt \rightarrow dx = \frac{1}{2} \cos t dt$$

$$\textcircled{*} = \int \frac{1}{\sqrt{1 - \operatorname{sen}^2 t}} \cdot \frac{1}{2} \cos t dt = \int \frac{1}{\cancel{\cos t}} \cdot \frac{1}{2} \cdot \cancel{\cos t} dt = \frac{1}{2} t + K =$$

$$= \frac{1}{2} \operatorname{arcsen}(2x+1) + C'$$

$$286) \int \frac{2^{3x}}{2^x - 4} dx = \int \frac{2^{2x} \cdot 2^x dx}{2^x - 4} = \int \frac{t^2 dt}{\ln 2 (t-4)} = \textcircled{*}$$

$$2^x = t \rightarrow 2^{2x} = t^2$$

$$2^x \cdot \ln 2 dx dt \rightarrow 2^x dx = \frac{dt}{\ln 2}$$

$$\textcircled{*} = \frac{1}{\ln 2} \int \frac{t^2}{t-4} dt = \left\{ \begin{array}{l} t^2 + 0t + 0 \\ -t^2 + 4t \\ -4t + 16 \\ 16 \end{array} \right\} \frac{t-4}{t+4} = \textcircled{*}$$

$$\textcircled{*} = \frac{1}{\ln 2} \cdot \left[\int (t+4) dt + \int \frac{16}{t-4} dt \right] =$$

$$= \frac{1}{\ln 2} \cdot \left[\frac{t^2}{2} + 4t + 16 \ln |t-4| \right] + K =$$

$$= \frac{1}{\ln 2} \cdot \left[\frac{2^{2x}}{2} + 4 \cdot 2^x + 16 \ln |2^x - 4| \right] + C =$$

$$= \frac{1}{\ln 2} \cdot \left(2^{2x-1} + 2^{x+2} + 16 \ln |2^x - 4| \right) + C$$

$$287) \int \frac{\sec(2x) + \cos x}{\cos x} dx = \int \frac{2 \sec x \cdot \cos x + \cos x}{\cos x} dx =$$

$$= \int \frac{2 \cancel{\sec x} \cancel{\cos x} + \cancel{\cos x}}{\cancel{\cos x}} dx + \int \frac{\cancel{\cos x}}{\cancel{\cos x}} dx = -2 \cos x + x + C$$

$$288) \int \frac{7}{x \sqrt[3]{\ln x}} dx = 7 \int \frac{1}{x} \cdot (\ln x)^{-1/3} dx = 7 \cdot \frac{(\ln x)^{2/3}}{2/3} + C =$$

$$= \frac{21}{2} \cdot \sqrt[3]{(\ln x)^2} + C$$

$$289) \int \frac{(\ln x)^2 + x}{x} dx = \int \frac{1}{x} (\ln x)^2 dx + \int 1 dx =$$

$$= \frac{(\ln x)^3}{3} + x + C$$

$$290) \int \frac{1}{\sqrt{x+2} + \sqrt{x-2}} dx = \int \frac{1}{4} (\sqrt{x+2} - \sqrt{x-2}) dx = \textcircled{*}$$

$$\frac{1}{\sqrt{x+2} + \sqrt{x-2}} \cdot \frac{(\sqrt{x+2} - \sqrt{x-2})}{(\sqrt{x+2} - \sqrt{x-2})} = \frac{(\sqrt{x+2} - \sqrt{x-2})}{(\sqrt{x+2})^2 - (\sqrt{x-2})^2} = \frac{1}{4} (\sqrt{x+2} - \sqrt{x-2})$$

$$\textcircled{*} = \frac{1}{4} \int (x+2)^{1/2} dx - \frac{1}{4} \int (x-2)^{1/2} dx =$$

$$= \frac{1}{4} \frac{(x+2)^{3/2}}{3/2} - \frac{1}{4} \frac{(x-2)^{3/2}}{3/2} + C = \frac{1}{6} \sqrt{(x+2)^3} - \frac{1}{6} \sqrt{(x-2)^3} + C$$

$$291) \int \frac{\sqrt{1+x^2} + \sqrt{1-x^2}}{\sqrt{1-x^4}} dx = \int \frac{\sqrt{1+x^2}}{\sqrt{1-x^4}} dx + \int \frac{\sqrt{1-x^2}}{\sqrt{1-x^4}} dx =$$

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

$$= \int \frac{1}{\sqrt{1-x^2}} dx + \int \frac{1}{\sqrt{1+x^2}} dx = \arcsen(x) + \int \frac{1}{\sqrt{1+x^2}} dx = \text{😊}$$

↙ La hacemos a parte

$$\int \frac{1}{\sqrt{1+x^2}} dx \rightarrow \sqrt{1+x^2} = t - x$$

$$(\sqrt{1+x^2})^2 = (t-x)^2 \Rightarrow 1+x^2 = t^2 - 2tx + x^2$$

$$\Rightarrow 2tx = t^2 - 1 \Rightarrow x = \frac{t^2 - 1}{2t}$$

$$x = \frac{t^2 - 1}{2t} \Rightarrow dx = \frac{4t^2 - 2t^2 + 2}{(2t)^2} dt = \frac{2t^2 + 2}{(2t)^2} dt$$

$$\int \frac{1}{\sqrt{1+x^2}} dx = \int \frac{1}{t - \left(\frac{t^2-1}{2t}\right)} \cdot \frac{2(t^2+1)}{(2t)^2} dt =$$

$$= \int \frac{1}{\frac{2t^2 - t^2 + 1}{2t}} \cdot \frac{2(t^2+1)}{(2t)^2} dt = \int \frac{1}{t^2+1} \cdot \frac{2(t^2+1)}{2t} dt =$$

$$= \int \frac{1}{t} dt = \ln |t| + C = \ln \left| x + \sqrt{1+x^2} \right| + C'$$

$$\Rightarrow \text{😊} = \operatorname{arcsen}(x) + \ln \left| x + \sqrt{1+x^2} \right| + C'$$

Nota:

En realidad la integral $\int \frac{1}{\sqrt{1+x^2}} dx$ es inmediata, siendo

$\int \frac{1}{\sqrt{1+x^2}} dx = \operatorname{argsinh}(x)$. Pero al no darse las funciones

hiperbólicas en bachillerato, se ha resuelto por cambio

de variable para obtener su forma logarítmica.

obviamente, $\operatorname{argsinh}(x) = \ln(x + \sqrt{x^2+1})$

$$292) \int \frac{x-1}{\sqrt{2x}-\sqrt{x+1}} dx = \int (\sqrt{2x} + \sqrt{x+1}) dx = \textcircled{*}$$

$$\frac{(x-1)}{\sqrt{2x}-\sqrt{x+1}} \cdot \frac{\sqrt{2x}+\sqrt{x+1}}{\sqrt{2x}+\sqrt{x+1}} = \frac{(x-1)(\sqrt{2x}+\sqrt{x+1})}{(\sqrt{2x})^2 - (\sqrt{x+1})^2} = \frac{\cancel{(x-1)}(\sqrt{2x}+\sqrt{x+1})}{\cancel{(x-1)}}$$

$$\textcircled{*} \int \sqrt{2x} dx + \int \sqrt{x+1} dx = \frac{1}{\cancel{2}} \int 2 (2x)^{1/2} dx + \int (x+1)^{1/2} dx =$$

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

$$293) \int e^{2x} \cdot \text{sen}(e^x) dx = \int \underbrace{e^x}_{u} \cdot \underbrace{e^x \cdot \text{sen}(e^x)}_{dv} dx = \textcircled{*}$$

$$u = e^x \quad du = e^x dx$$

$$dv = e^x \text{sen}(e^x) dx \quad v = -\cos(e^x)$$

$$\textcircled{*} = -e^x \cos(e^x) + \int e^x \cos(e^x) dx = -e^x \cos(e^x) + \text{sen}(e^x) + C$$

