➟ Formulario A: Integrales

En este formulario: $a,b,p,q,C \in \mathbb{R}$ son constantes reales, $m,n \in \mathbb{N}$ son enteros positivos y $u = u(x)$ y $v = v(x)$ son funciones que dependen x.

Fórmulas básicas

1. $\int 0\,dx = C$

2. $\int k\,dx = kx + C$

3. $\int (a \cdot u \pm b \cdot v)dx = a\int u dx \pm b\int v dx + C$

4. $\int u^n\,du = \dfrac{u^{n+1}}{n+1} + C;\ \ \forall\ n \neq -1$ regla de la potencia

5. $\int u\,dv = uv - \int v\,du$ integración por partes

6. $\int a^n\,du = \dfrac{a^n}{\ln(a)} + C$

7. $\int \dfrac{du}{u} = \ln|u| + C$

8. $\int e^u\,dx = e^u + C$

Fórmulas trigonométricas

9. $\int \operatorname{sen}(u)\,du = -\cos(u) + C$

10. $\int \cos(u)\,du = \operatorname{sen}(u) + C$

11. $\int \tan(u)du = \begin{cases} \ln[\operatorname{sen}(u)] + C \\ -\ln[\cos(u)] + C \end{cases}$

12. $\int \cot(u)\,du = \ln[\operatorname{sen}(u)] + C$

13. $\int \sec(u)\,du = \begin{cases} \ln[\sec(u) + \tan(u)] + C \\ \ln\left[\tan\left(\dfrac{u}{2} + \dfrac{\pi}{4}\right)\right] + C \end{cases}$

14. $\int \csc(u)\,du = \begin{cases} \ln[\csc(u) - \cot(u)] + C \\ \ln\left[\tan\left(\dfrac{u}{2}\right)\right] + C \end{cases}$

15. $\int \sec^2(u)\,du = \tan(u) + C$

16. $\int \csc^2(u)\,du = -\cot(u) + C$

17. $\int \tan^2(u)\,du = \tan(u) - u + C$

18. $\int \cot^2(u)\,du = -\cot(u) - u + C$

19. $\int \operatorname{sen}^2(u)\,du = \begin{cases} \dfrac{u}{2} - \dfrac{\operatorname{sen}(2u)}{4} + C \\ \dfrac{1}{2}[u - \operatorname{sen}(u)\cos(u)] + C \end{cases}$

20. $\int \cos^2(u)\,du = \begin{cases} \dfrac{u}{2} + \dfrac{\operatorname{sen}(2u)}{4} + C \\ \dfrac{1}{2}[u + \operatorname{sen}(u)\cos(u)] + C \end{cases}$

21. $\int \sec(u)\tan(u)\,du = \sec(u) + C$

22. $\int \csc(u)\cot(u)\,du = -\csc(c) + C$

Fórmulas trigonométricas hiperbólicas

23. $\int \operatorname{sen}\,h(u)\,du = \cosh(u) + C$

24. $\int \cosh(u)\,du = \operatorname{sen}\,h(u) + C$

25. $\int \tanh(u)\,du = \ln[\cosh(u)] + C$

26. $\int \coth(u)\,du = \ln[\operatorname{sen}\,h(u)] + C$

27. $\int \operatorname{sech}(u)\,du = \begin{cases} \operatorname{sen}^{-1}[\tanh(u)] + C \\ 2\tan^{-1}(e^u) + C \end{cases}$

28. $\int \operatorname{csch}(u)\,du = \begin{cases} \ln\left[\tanh\left(\dfrac{u}{2}\right)\right] + C \\ -2\coth^{-1}(e^u) + C \end{cases}$

29. $\int \operatorname{sech}^2(u)\,du = \tanh(u) + C$

30. $\int \operatorname{csch}^2(u)\,du = -\coth(u) + C$

31. $\int \tanh^2(u)\,du = u - \tanh(u) + C$

32. $\int \coth^2(u)\,du = u - \coth(u) + C$

33. $\int \operatorname{sen}\,h^2(u)\,du = \begin{cases} \dfrac{\operatorname{sen}\,h(2u)}{4} - \dfrac{u}{2} + C \\ \dfrac{1}{2}[\operatorname{sen}\,h(u)\cosh(u) - u] + C \end{cases}$

34. $\int \cosh^2(u)\,du = \begin{cases} \dfrac{\operatorname{sen}\,h(2u)}{4} + \dfrac{u}{2} + C \\ \dfrac{1}{2}[\operatorname{sen}\,h(u)\cosh(u) + u] + C \end{cases}$

35. $\int \operatorname{sech}(u)\tanh(u)\,du = -\operatorname{sech}(u) + C$

36. $\int \operatorname{csch}(u)\coth(u)\,du = -\operatorname{csch}(u) + C$

Fórmulas con $au+b$

37. $\int \frac{du}{au+b} = \frac{1}{a}\ln(au+b)+C$

38. $\int \frac{u}{au+b}du = \frac{u}{a} - \frac{b}{a^2}\ln(au+b)+C$

39. $\int \frac{u^2}{au+b}du = \frac{(au+b)^2}{2a^3} - \frac{2b(au+b)}{a^3} + \frac{b^2}{a^3}\ln(au+b)+C$

40. $\int \frac{u^3}{au+b}du = \frac{(au+b)^3}{3a^4} - \frac{3b(au+b)^2}{2a^4} + \frac{3b^2(au+b)}{a^4} - \frac{b^3}{a^4}\ln(au+b)+C$

41. $\int \frac{du}{u(au+b)} = \frac{1}{b}\ln\left(\frac{u}{au+b}\right)+C$

42. $\int \frac{du}{u^2(au+b)} = -\frac{1}{bu} + \frac{a}{b^2}\ln\left(\frac{au+b}{u}\right)+C$

43. $\int \frac{du}{(au+b)^2} = -\frac{1}{a(au+b)}+C$

44. $\int \frac{u}{(au+b)^2}du = \frac{b}{a^2(au+b)} + \frac{1}{a^2}\ln(au+b)+C$

45. $\int \frac{u^2}{(au+b)^2}du = \frac{au+b}{a^3} - \frac{b^2}{a^3(au+b)} - \frac{2b}{a^3}\ln(au+b)+C$

46. $\int \frac{du}{u(au+b)^2} = \frac{1}{b(au+b)} + \frac{1}{b^2}\ln\left(\frac{u}{au+b}\right)+C$

47. $\int \frac{du}{u^2(au+b)^2} = -\frac{a}{b^2(au+b)} - \frac{1}{b^2u} + \frac{2a}{b^3}\ln\left(\frac{au+b}{u}\right)+C$

48. $\int \frac{du}{(au+b)^3} = -\frac{1}{2(au+b)^2}+C$

49. $\int \frac{u}{(au+b)^3}du = -\frac{1}{a^2(au+b)} + \frac{b}{2a^2(au+b)^2}+C$

50. $\int \frac{u^2}{(au+b)^3}du = \frac{2b}{a^3(au+b)} - \frac{b^2}{2a^3(au+b)^2} + \frac{1}{a^3}\ln(au+b)+C$

51. $\int (au+b)du = \frac{(au+b)^2}{2a}+C$

52. $\int (au+b)^n du = \frac{(au+b)^{n+1}}{(n+1)a}+C \quad \forall\ n\neq -1$

53. $\int u(au+b)^n du = \frac{(au+b)^{n+2}}{(n+2)a^2} - \frac{b(au+b)^{n+1}}{(n+1)a^2} \quad \forall\ n\neq -1,-2$

54. $\int u^2(au+b)^n du = \frac{(au+b)^{n+3}}{(n+3)a^3} - \frac{2b(au+b)^{n+2}}{(n+2)a^3} + \frac{b^2(au+b)^{n+1}}{(n+1)a^3}+C \quad \forall n\neq -1,-2,-3$

55.
$$\int u^m(au+b)^n du = \begin{cases} \frac{u^{m+1}(au+b)^n}{m+n+1} + \frac{nb}{m+n+1}\int u^m(au+b)^{n-1}du \\ \frac{u^m(au+b)^{n+1}}{(m+n+1)a} - \frac{mb}{(m+n+1)a}\int u^{m-1}(au+b)^n du \\ -\frac{u^{m+1}(au+b)^{n+1}}{(n+1)b} + \frac{m+n+2}{(n+1)b}\int u^m(au+b)^{n+1}du \end{cases}$$

Fórmulas con $\sqrt{au+b}$

56. $\int \frac{du}{\sqrt{au+b}} = \frac{2\sqrt{au+b}}{a}+C$

57. $\int \frac{u}{\sqrt{au+b}}du = \frac{2(au-2b)}{3a^2}\sqrt{au+b}+C$

58. $\int \frac{u^2}{\sqrt{au+b}}du = \frac{2(3a^2u^2-4abu+8b^2)}{15a^3}\sqrt{au+b}+C$

59.
$$\int \frac{du}{u\sqrt{au+b}} = \begin{cases} \frac{1}{\sqrt{b}}\ln\left(\frac{\sqrt{au+b}-\sqrt{b}}{\sqrt{au+b}+\sqrt{b}}\right)+C \\ \frac{2}{\sqrt{-b}}\tan^{-1}\sqrt{\frac{au+b}{-b}}+C \end{cases}$$

60. $\int \frac{du}{u^2\sqrt{au+b}} = -\frac{\sqrt{au+b}}{bu} - \frac{a}{2b}\int \frac{du}{u\sqrt{au+b}}$

61. $\int \sqrt{au+b}\,du = \frac{2\sqrt{(au+b)^3}}{3a}+C$

62. $\int u\sqrt{au+b}\,du = \frac{2(3au-2b)}{15a^2}\sqrt{(au+b)^3}+C$

63. $\int u^2\sqrt{au+b}\,du = \frac{2(15a^2u^2-12abu+8b^2)}{105a^3}\sqrt{(au+b)^3}+C$

64. $\int \frac{\sqrt{au+b}}{u}du = 2\sqrt{au+b} + b\int \frac{du}{u\sqrt{au+b}}$

65. $\int \frac{\sqrt{au+b}}{u^2}du = -\frac{\sqrt{au+b}}{u} + \frac{a}{2}\int \frac{du}{u\sqrt{au+b}}$

66. $\int \frac{u^m}{\sqrt{au+b}}du = \frac{2u^m\sqrt{au+b}}{(2m+1)a} - \frac{2mb}{(2m+1)a}\int \frac{u^{m-1}}{\sqrt{au+b}}du$

67. $\int \frac{du}{u^m\sqrt{au+b}} = -\frac{\sqrt{au+b}}{(m-1)bu^{m-1}} - \frac{(2m-3)a}{(2m-2)b}\int \frac{du}{u^{m-1}\sqrt{au+b}}$

68. $\int u^m\sqrt{au+b}\,du = \frac{2u^m}{(2m+3)a}(au+b)^{\frac{3}{2}} - \frac{2mb}{(2m+3)a}\int u^{m-1}\sqrt{au+b}du$

69. $\int \frac{\sqrt{au+b}}{u^m}du = -\frac{\sqrt{au+b}}{(m-1)u^{m-1}} + \frac{a}{2(m-1)}\int \frac{du}{u^{m-1}\sqrt{au+b}}$

70. $\int \frac{\sqrt{au+b}}{u^m}du = -\frac{(au+b)^{\frac{3}{2}}}{(m-1)bu^{m-1}} - \frac{(2m-5)a}{(2m-2)b}\int \frac{\sqrt{au+b}}{u^{m-1}}du$

71. $\int (au+b)^{\frac{m}{2}}du = \frac{2(au+b)^{\frac{m+2}{2}}}{a(m+2)}+C$

72. $\int u(au+b)^{\frac{m}{2}}du = \frac{2(au+b)^{\frac{m+4}{2}}}{a^2(m+4)} - \frac{2b(au+b)^{\frac{m+2}{2}}}{a^2(m+2)}+C$

73. $\int u^2(au+b)^{\frac{m}{2}}du = \frac{2(au+b)^{\frac{m+6}{2}}}{a^3(m+6)} - \frac{4b(au+b)^{\frac{m+4}{2}}}{a^3(m+4)} + \frac{2b^2(au+b)^{\frac{m+2}{2}}}{a^3(m+2)}+C$

74. $\int \frac{(au+b)^{\frac{m}{2}}}{u}du = \frac{2(au+b)^{\frac{m}{2}}}{m} + b\int \frac{(au+b)^{\frac{m-2}{2}}}{u}du$

75. $\int \frac{(au+b)^{\frac{m}{2}}}{u^2}du = -\frac{(au+b)^{\frac{m+2}{2}}}{bu} + \frac{am}{2b}\int \frac{(au+b)^{\frac{m}{2}}}{u}du$

76. $\int \frac{du}{u(au+b)^{\frac{m}{2}}} = \frac{2}{b(m-2)(au+b)^{\frac{m-2}{2}}} + \frac{1}{b}\int \frac{du}{u(au+b)^{\frac{m-2}{2}}}$

Fórmulas con $u^2 + a^2$

77. $\int \frac{du}{u^2+a^2} = \frac{1}{a}\tan^{-1}\left(\frac{u}{a}\right) + C$

78. $\int \frac{u}{u^2+a^2}du = \frac{1}{2}\ln\left(u^2+a^2\right) + C$

79. $\int \frac{u^2}{u^2+a^2}du = u - a\tan^{-1}\left(\frac{u}{a}\right) + C$

80. $\int \frac{u^3}{u^2+a^2}du = \frac{u^2}{2} - \frac{a^2}{2}\ln\left(u^2+a^2\right) + C$

81. $\int \frac{du}{u(u^2+a^2)} = \frac{1}{2a^2}\ln\left(\frac{u^2}{u^2+a^2}\right) + C$

82. $\int \frac{du}{u^2(u^2+a^2)} = -\frac{1}{a^2u} - \frac{1}{a^3}\tan^{-1}\left(\frac{u}{a}\right) + C$

83. $\int \frac{du}{u^3(u^2+a^2)} = -\frac{1}{2a^2u^2} - \frac{1}{2a^4}\ln\left(\frac{u^2}{u^2+a^2}\right) + C$

84. $\int \frac{du}{\left(u^2+a^2\right)^2} = \frac{u}{2a^2(u^2+a^2)} + \frac{1}{2a^3}\tan^{-1}\left(\frac{u}{a}\right) + C$

85. $\int \frac{u}{\left(u^2+a^2\right)^2}du = -\frac{1}{2(u^2+a^2)} + C$

86. $\int \frac{u^2}{\left(u^2+a^2\right)^2}du = -\frac{u}{2(u^2+a^2)} + \frac{1}{2a}\tan^{-1}\left(\frac{u}{a}\right) + C$

87. $\int \frac{u^3}{\left(u^2+a^2\right)^2}du = \frac{a^2}{2(u^2+a^2)} + \frac{1}{2}\ln(u^2+a^2) + C$

88. $\int \frac{du}{u\left(u^2+a^2\right)^2} = \frac{1}{2a^2(u^2+a^2)} + \frac{1}{2a^4}\left(\frac{u^2}{u^2+a^2}\right) + C$

89. $\int \frac{du}{u^2\left(u^2+a^2\right)^2} = -\frac{1}{a^4u} - \frac{u}{2a^4(u^2+a^2)} - \frac{3}{2a^5}\tan^{-1}\left(\frac{u}{a}\right) + C$

90. $\int \frac{du}{u^3\left(u^2+a^2\right)^2} = -\frac{1}{2a^4u^2} - \frac{1}{2a^4(u^2+a^2)} - \frac{1}{a^6}\ln\left(\frac{u^2}{u^2+a^2}\right) + C$

91. $\int \frac{du}{\left(u^2+a^2\right)^n} = -\frac{u}{2a^2(n-1)(u^2+a^2)^{n-1}} + \frac{2n-3}{(2n-2)a^2}\int \frac{du}{\left(u^2+a^2\right)^{n-1}}$

92. $\int \frac{u}{\left(u^2+a^2\right)^n}du = -\frac{1}{2(n-1)(u^2+a^2)^{n-1}} + C$

93. $\int \frac{du}{u\left(u^2+a^2\right)^n} = \frac{1}{2a^2(n-1)(u^2+a^2)^{n-1}} + \frac{1}{a^2}\int \frac{du}{u(u^2+a^2)^{n-1}}$

94. $\int \frac{u^m}{\left(u^2+a^2\right)^n}du = \int \frac{u^{m-2}}{\left(u^2+a^2\right)^{n-1}}du - a^2\int \frac{u^{m-2}}{(u^2+a^2)^n}du$

95. $\int \frac{du}{u^m\left(u^2+a^2\right)^n} = \frac{1}{a^2}\int \frac{du}{u^m\left(u^2+a^2\right)^{n-1}} - \frac{1}{a^2}\int \frac{du}{u^{m-2}\left(u^2+a^2\right)^n}$

Fórmulas con $u^2 - a^2$

96. $\int \frac{du}{u^2-a^2} = \begin{cases} \frac{1}{2a}\ln\left(\frac{u-a}{u+a}\right) + C \\ -\frac{1}{a}\coth^{-1}\left(\frac{u}{a}\right) + C \end{cases}$

97. $\int \frac{u}{u^2-a^2}du = \frac{1}{2}\ln(u^2-a^2) + C$

98. $\int \frac{u^2}{u^2-a^2}du = u + \frac{a}{2}\ln\left(\frac{u-a}{u+a}\right) + C$

99. $\int \frac{u^3}{u^2-a^2}du = \frac{u^2}{2} + \frac{a^2}{2}\ln(u^2-a^2) + C$

100. $\int \frac{du}{u(u^2-a^2)} = \frac{1}{2a^2}\ln\left(\frac{u^2-a^2}{u^2}\right) + C$

101. $\int \frac{du}{u^2(u^2-a^2)} = \frac{1}{a^2u} + \frac{1}{2a^3}\ln\left(\frac{u-a}{u+a}\right) + C$

102. $\int \frac{du}{u^3(u^2-a^2)} = \frac{1}{2a^2u^2} - \frac{1}{2a^4}\ln\left(\frac{u^2}{u^2-a^2}\right) + C$

103. $\int \frac{du}{\left(u^2-a^2\right)^2} = -\frac{u}{2a^2(u^2-a^2)} - \frac{1}{4a^3}\ln\left(\frac{u-a}{u+a}\right) + C$

104. $\int \frac{u}{(u^2-a^2)^2}du = -\frac{1}{2(u^2-a^2)} + C$

105. $\int \frac{u^2}{\left(u^2-a^2\right)^2}du = -\frac{u}{2\left(u^2-a^2\right)} + \frac{1}{4a}\ln\left(\frac{u-a}{u+a}\right) + C$

106. $\int \frac{u^3}{\left(u^2-a^2\right)^2}du = -\frac{a}{2\left(u^2-a^2\right)} + \frac{1}{2}\ln\left(u^2-a^2\right) + C$

107. $\int \frac{du}{u\left(u^2-a^2\right)^2} = -\frac{1}{2a^2\left(u^2-a^2\right)} + \frac{1}{2a^4}\ln\left(\frac{u^2}{u^2-a^2}\right) + C$

108. $\int \frac{du}{u^2\left(u^2-a^2\right)^2} = -\frac{1}{a^4u} - \frac{u}{2a^4\left(u^2-a^2\right)} - \frac{3}{4a^5}\ln\left(\frac{u-a}{u+a}\right) + C$

109. $\int \frac{du}{u^3\left(u^2-a^2\right)^2} = -\frac{1}{2a^4u^2} - \frac{1}{2a^4\left(u^2-a^2\right)} + \frac{1}{a^6}\ln\left(\frac{u^2}{u^2-a^2}\right) + C$

110. $\int \frac{du}{\left(u^2-a^2\right)^n} = -\frac{u}{2a^2(n-1)\left(u^2-a^2\right)^{n-1}} - \frac{2n-3}{(2n-2)a^2}\int \frac{du}{\left(u^2-a^2\right)^{n-1}}$

111. $\int \frac{u}{(u^2-a^2)^n}du = -\frac{1}{2(n-1)(u^2-a^2)^{n-1}} + C$

112. $\int \frac{du}{u(u^2-a^2)^n} = -\frac{1}{2a^2(n-1)(u^2-a^2)^{n-1}} - \frac{1}{a^2}\int \frac{du}{u(u^2-a^2)^{n-1}}$

113. $\int \frac{u^m}{(u^2-a^2)^n}du = \int \frac{u^{m-2}}{(u^2-a^2)^{n-1}}du + a^2\int \frac{u^{m-2}}{(u^2-a^2)^n}du$

114. $\int \frac{du}{u^m(u^2-a^2)^n} = \frac{1}{a^2}\int \frac{du}{u^{m-2}(u^2-a^2)^n} + \frac{1}{a^2}\int \frac{du}{u^m(u^2-a^2)^{n-1}}$

Fórmulas con $a^2 - u^2$, $u^2 < a^2$

115. $\int \frac{du}{a^2-u^2} = \begin{cases} \frac{1}{2a}\ln\left(\frac{a+u}{a-u}\right) + C \\ \frac{1}{a}\tanh^{-1}\left(\frac{u}{a}\right) + C \end{cases}$

116. $\int \frac{u}{a^2-u^2}du = -\frac{1}{2}\ln(a^2-u^2) + C$

117. $\int \frac{u^2}{a^2-u^2}du = -u + \frac{a}{2}\ln\left(\frac{a+u}{a-u}\right) + C$

118. $\int \frac{u^3}{a^2-u^2}du = -\frac{u^2}{2} - \frac{a^2}{2}\ln(a^2-u^2) + C$

119. $\int \frac{du}{u(a^2-u^2)} = \frac{1}{2a^2}\ln\left(\frac{u^2}{a^2-u^2}\right) + C$

120. $\int \frac{du}{u^2(a^2-u^2)} = \frac{1}{a^2u} + \frac{1}{2a^3}\ln\left(\frac{a+u}{a-u}\right) + C$

121. $\int \frac{du}{u^3(a^2-u^2)} = -\frac{1}{2a^2u^2} + \frac{1}{2a^4}\ln\left(\frac{u^2}{a^2-u^2}\right) + C$

122. $\int \frac{du}{(a^2-u^2)^2} = \frac{u}{2a^2(a^2-u^2)} + \frac{1}{4a^3}\ln\left(\frac{a+u}{a-u}\right) + C$

123. $\int \frac{u}{(a^2-u^2)^2}du = \frac{1}{2(a^2-u^2)} + C$

124. $\int \frac{u^2}{(a^2-u^2)^2}du = \frac{u}{2(a^2-u^2)} - \frac{1}{4a}\ln\left(\frac{a+u}{a-u}\right) + C$

125. $\int \frac{u^3}{(a^2-u^2)^2}du = \frac{a^2}{2(a^2-u^2)} + \frac{1}{2}\ln(a^2-u^2) + C$

126. $\int \frac{du}{u(a^2-u^2)^2} = \frac{1}{2a^2(a^2-u^2)} + \frac{1}{2a^4}\ln\left(\frac{u^2}{a^2-u^2}\right) + C$

127. $\int \frac{du}{u^2(a^2-u^2)^2} = -\frac{1}{a^4u} + \frac{u}{2a^4(a^2-u^2)} + \frac{3}{4a^5}\ln\left(\frac{a+u}{a-u}\right) + C$

128. $\int \frac{du}{u^3(a^2-u^2)^2} = -\frac{1}{2a^4u^2} + \frac{1}{2a^4(a^2-u^2)} + \frac{1}{a^6}\ln\left(\frac{u^2}{a^2-u^2}\right) + C$

129. $\int \frac{du}{(a^2-u^2)^n} = \frac{u}{2a^2(n-1)(a^2-u^2)^{n-1}} + \frac{2n-3}{(2n-2)a^2}\int \frac{du}{(a^2-u^2)^{n-1}}$

130. $\int \frac{u}{(a^2-u^2)^n}du = \frac{1}{2a^2(n-1)(a^2-u^2)^{n-1}} + C$

Fórmulas con $\sqrt{u^2+a^2}$

131. $\int \sqrt{u^2+a^2}\,du = \frac{u\sqrt{u^2+a^2}}{2} + \frac{a^2}{2}\ln\left(u+\sqrt{u^2+a^2}\right) + C$

132. $\int u\sqrt{u^2+a^2}\,du = \frac{(u^2+a^2)^{\frac{3}{2}}}{3} + C$

133. $\int u^2\sqrt{u^2+a^2}\,du = \frac{u(u^2+a^2)^{\frac{3}{2}}}{4} - \frac{a^2u\sqrt{u^2+a^2}}{8} - \frac{a^4}{8}\ln\left(u+\sqrt{u^2+a^2}\right) + C$

134. $\int u^3\sqrt{u^2+a^2}\,du = \frac{(u^2+a^2)^{\frac{5}{2}}}{5} - \frac{a^2(u^2+a^2)^{\frac{3}{2}}}{3} + C$

135. $\int \frac{du}{\sqrt{u^2+a^2}} = \begin{cases} \ln\left(u+\sqrt{u^2+a^2}\right) + C \\ \operatorname{senh}^{-1}\left(\frac{u}{a}\right) + C \end{cases}$

136. $\int \frac{u}{\sqrt{u^2+a^2}}du = \sqrt{u^2+a^2} + C$

137. $\int \frac{u^2}{\sqrt{u^2+a^2}}du = \frac{u\sqrt{u^2+a^2}}{2} - \frac{a^2}{2}\ln\left(u+\sqrt{u^2+a^2}\right) + C$

138. $\int \frac{u^3}{\sqrt{u^2+a^2}}du = \frac{(u^2+a^2)^{\frac{3}{2}}}{3} - a^2\sqrt{u^2+a^2} + C$

139. $\int \frac{du}{u\sqrt{u^2+a^2}} = -\frac{1}{a}\ln\left(\frac{a+\sqrt{u^2+a^2}}{u}\right) + C$

140. $\int \frac{du}{u^2\sqrt{u^2+a^2}} = -\frac{\sqrt{u^2+a^2}}{a^2u} + C$

141. $\int \frac{du}{u^3\sqrt{u^2+a^2}} = -\frac{\sqrt{u^2+a^2}}{2a^2u^2} + \frac{1}{2a^3}\ln\left(\frac{a+\sqrt{u^2+a^2}}{u}\right) + C$

142. $\int \frac{\sqrt{u^2+a^2}}{u}du = \sqrt{u^2+a^2} - a\ln\left(\frac{a+\sqrt{u^2+a^2}}{u}\right) + C$

143. $\int \frac{\sqrt{u^2+a^2}}{u^2}du = -\frac{\sqrt{u^2+a^2}}{u} + \ln\left(u+\sqrt{u^2+a^2}\right) + C$

144. $\int \frac{\sqrt{u^2+a^2}}{u^3}du = -\frac{\sqrt{u^2+a^2}}{2u^2} - \frac{1}{2a}\ln\left(\frac{a+\sqrt{u^2+a^2}}{u}\right)+C$

145. $\int \frac{du}{\left(u^2+a^2\right)^{\frac{3}{2}}} = \frac{u}{a^2\sqrt{u^2+a^2}}+C$

146. $\int \frac{u}{\left(u^2+a^2\right)^{\frac{3}{2}}}du = -\frac{1}{\sqrt{u^2+a^2}}+C$

147. $\int \frac{u^2}{\left(u^2+a^2\right)^{\frac{3}{2}}}du = -\frac{u}{\sqrt{u^2+a^2}} + \ln\left(u+\sqrt{u^2+a^2}\right)+C$

148. $\int \frac{u^3}{\left(u^2+a^2\right)^{\frac{3}{2}}}du = \sqrt{u^2+a^2} + \frac{a^2}{\sqrt{u^2+a^2}}+C$

149. $\int \frac{du}{u\left(u^2+a^2\right)^{\frac{3}{2}}} = \frac{1}{a^2\sqrt{u^2+a^2}} - \frac{1}{a^3}\ln\left(\frac{a+\sqrt{u^2+a^2}}{u}\right)+C$

150. $\int \frac{du}{u^2\left(u^2+a^2\right)^{\frac{3}{2}}} = -\frac{\sqrt{u^2+a^2}}{a^4u} - \frac{u}{a^4\sqrt{u^2+a^2}}+C$

151. $\int \frac{du}{u^3\left(u^2+a^2\right)^{\frac{3}{2}}} = -\frac{1}{2a^2u^2\sqrt{u^2+a^2}} - \frac{3}{2a^4\sqrt{u^2+a^2}} + \frac{3}{2a^5}\ln\left(\frac{a+\sqrt{u^2+a^2}}{u}\right)+C$

152. $\int \left(u^2+a^2\right)^{\frac{3}{2}}du = \frac{u\left(u^2+a^2\right)^{\frac{3}{2}}}{4} + \frac{3a^2u\sqrt{u^2+a^2}}{8} + \frac{3}{8}a^4\ln\left(u+\sqrt{u^2+a^2}\right)+C$

153. $\int u\left(u^2+a^2\right)^{\frac{3}{2}}du = \frac{\left(u^2+a^2\right)^{\frac{5}{2}}}{5}+C$

154. $\int u^2\left(u^2+a^2\right)^{\frac{3}{2}}du = \frac{u\left(u^2+a^2\right)^{\frac{5}{2}}}{6} - \frac{a^2u\left(u^2+a^2\right)^{\frac{3}{2}}}{24} - \frac{a^4u\sqrt{u^2+a^2}}{16} - \frac{a^6}{16}\ln\left(u+\sqrt{u^2+a^2}\right)+C$

155. $\int \frac{\left(u^2+a^2\right)^{\frac{3}{2}}}{u}du = \frac{\left(u^2+a^2\right)^{\frac{3}{2}}}{3} + a^2\sqrt{u^2+a^2} - a^3\ln\left(\frac{a+\sqrt{u^2+a^2}}{u}\right)+C$

156. $\int \frac{\left(u^2+a^2\right)^{\frac{3}{2}}}{u^2}du = -\frac{\left(u^2+a^2\right)^{\frac{3}{2}}}{u} + \frac{3u\sqrt{u^2+a^2}}{2} + \frac{3}{2}a^2\ln\left(u+\sqrt{u^2+a^2}\right)+C$

157. $\int \frac{\left(u^2+a^2\right)^{\frac{3}{2}}}{u^3}du = -\frac{\left(u^2+a^2\right)^{\frac{3}{2}}}{2u^2} + \frac{3}{2}\sqrt{u^2+a^2} - \frac{3}{2}a\ln\left(\frac{a+\sqrt{u^2+a^2}}{u}\right)+$

Fórmulas con $\sqrt{u^2-a^2}$

158. $\int \frac{du}{\sqrt{u^2-a^2}} = \ln\left(u+\sqrt{u^2-a^2}\right)+C$

159. $\int \frac{u}{\sqrt{u^2-a^2}}du = \sqrt{u^2-a^2}+C$

160. $\int \frac{u^2}{\sqrt{u^2-a^2}}du = \frac{u\sqrt{u^2-a^2}}{2} + \frac{a^2}{2}\ln\left(u+\sqrt{u^2-a^2}\right)+C$

161. $\int \frac{u^3}{\sqrt{u^2-a^2}}du = \frac{\left(u^2-a^2\right)^{\frac{3}{2}}}{3} + a^2\sqrt{u^2-a^2}+C$

162. $\int \frac{du}{u\sqrt{u^2-a^2}} = \frac{1}{a}\sec^{-1}\left(\frac{u}{a}\right)+C$

163. $\int \frac{du}{u^2\sqrt{u^2-a^2}} = \frac{\sqrt{u^2-a^2}}{a^2u}+C$

164. $\int \frac{du}{u^3\sqrt{u^2-a^2}} = \frac{\sqrt{u^2-a^2}}{2a^2u^2} + \frac{1}{2a^3}\sec^{-1}\left(\frac{u}{a}\right)+C$

165. $\int \sqrt{u^2-a^2}du = \frac{u\sqrt{u^2-a^2}}{2} - \frac{a^2}{2}\ln\left(u+\sqrt{u^2-a^2}\right)+C$

166. $\int u\sqrt{u^2-a^2}du = \frac{\left(u^2-a^2\right)^{\frac{3}{2}}}{3}+C$

167. $\int u^2\sqrt{u^2-a^2}du = \frac{u\left(u^2-a^2\right)^{\frac{3}{2}}}{4} + \frac{a^2u\sqrt{u^2-a^2}}{8} - \frac{a^4}{8}\ln\left(u+\sqrt{u^2-a^2}\right)+C$

168. $\int u^3\sqrt{u^2-a^2}du = \frac{\left(u^2-a^2\right)^{\frac{5}{2}}}{5} + \frac{a\left(u^2-a^2\right)^{\frac{3}{2}}}{3}+C$

169. $\int \frac{\sqrt{u^2-a^2}}{u}du = \sqrt{u^2-a^2} - a\sec^{-1}\left(\frac{u}{a}\right)+C$

170. $\int \frac{\sqrt{u^2-a^2}}{u^2}du = -\frac{\sqrt{u^2-a^2}}{u} + \ln\left(u+\sqrt{u^2-a^2}\right)+C$

171. $\int \frac{\sqrt{u^2-a^2}}{u^3}du = -\frac{\sqrt{u^2-a^2}}{2u^2} + \frac{1}{2a}\sec^{-1}\left(\frac{u}{a}\right)+C$

172. $\int \frac{du}{\left(u^2-a^2\right)^{\frac{3}{2}}} = -\frac{u}{a^2\sqrt{u^2-a^2}}+C$

173. $\int \frac{u}{\left(u^2-a^2\right)^{\frac{3}{2}}}du = -\frac{1}{\sqrt{u^2-a^2}}+C$

174. $\int \frac{u^2}{\left(u^2-a^2\right)^{\frac{3}{2}}}du = -\frac{u}{\sqrt{u^2-a^2}}+\ln\left(u+\sqrt{u^2-a^2}\right)+C$

175. $\int \frac{u^3}{\left(u^2-a^2\right)^{\frac{3}{2}}}du = \sqrt{u^2-a^2}-\frac{a^2}{\sqrt{u^2-a^2}}+C$

176. $\int \frac{du}{u\left(u^2-a^2\right)^{\frac{3}{2}}} = -\frac{1}{a^2\sqrt{u^2-a^2}}-\frac{1}{a^3}\sec^{-1}\left(\frac{u}{a}\right)+C$

177. $\int \frac{du}{u^2\left(u^2-a^2\right)^{\frac{3}{2}}} = -\frac{\sqrt{u^2-a^2}}{a^4u}-\frac{u}{a^4\sqrt{u^2-a^2}}+C$

178. $\int \frac{du}{u^3\left(u^2-a^2\right)^{\frac{3}{2}}} = \frac{1}{2a^2u^2\sqrt{u^2-a^2}}-\frac{3}{2a^4\sqrt{u^2-a^2}}-\frac{3}{2a^5}\sec^{-1}\left(\frac{u}{a}\right)+C$

179. $\int\left(u^2-a^2\right)^{\frac{3}{2}}du = 2u\sqrt{u^2-a^2}\left(\frac{1}{8}u^2-\frac{5}{16}a^2\right)-\frac{3}{8}a^4\ln\left(\left|-u+\sqrt{u^2-a^2}\right|\right)+C$

180. $\int u\left(u^2-a^2\right)^{\frac{3}{2}}du = \frac{\left(u^2-a^2\right)^{\frac{5}{2}}}{5}+C$

181. $\int u^2\left(u^2-a^2\right)^{\frac{3}{2}}du = \frac{u\left(u^2-a^2\right)^{\frac{5}{2}}}{6}+\frac{a^2u\left(u^2-a^2\right)^{\frac{3}{2}}}{24}-\frac{a^4u\sqrt{u^2-a^2}}{16}+\frac{a^6}{16}\ln\left(u+\sqrt{u^2-a^2}\right)+C$

182. $\int u^3\left(u^2-a^2\right)^{\frac{3}{2}}du = \frac{\left(u^2-a^2\right)^{\frac{7}{2}}}{7}+\frac{a^2\left(u^2-a^2\right)^{\frac{5}{2}}}{5}+C$

183. $\int \frac{\left(u^2-a^2\right)^{\frac{3}{2}}}{u}du = \frac{\left(u^2-a^2\right)^{\frac{3}{2}}}{3}-a^2\sqrt{u^2-a^2}+a^3\sec^{-1}\left(\frac{u}{a}\right)+C$

184. $\int \frac{\left(u^2-a^2\right)^{\frac{3}{2}}}{u^2}du = -\frac{\left(u^2-a^2\right)^{\frac{3}{2}}}{u}+\frac{3u\sqrt{u^2-a^2}}{2}-\frac{3}{2}a^2\ln\left(u+\sqrt{u^2-a^2}\right)+C$

185. $\int \frac{\left(u^2-a^2\right)^{\frac{3}{2}}}{u^3}du = -\frac{\left(u^2-a^2\right)^{\frac{3}{2}}}{2u^2}+\frac{3\sqrt{u^2-a^2}}{2}-\frac{3}{2}a\sec^{-1}\left(\frac{u}{a}\right)+C$

Fórmulas con $\sqrt{a^2-u^2}$

186. $\int \frac{du}{\sqrt{a^2-u^2}} = \operatorname{sen}^{-1}\left(\frac{u}{a}\right)+C$

187. $\int \frac{u}{\sqrt{a^2-u^2}}du = -\sqrt{a^2-u^2}+C$

188. $\int \frac{u^2}{\sqrt{a^2-u^2}}du = -\frac{u\sqrt{a^2-u^2}}{2}+\frac{a^2}{2}\operatorname{sen}^{-1}\left(\frac{u}{a}\right)+C$

189. $\int \frac{u^3}{\sqrt{a^2-u^2}}du = \frac{\left(a^2-u^2\right)^{\frac{3}{2}}}{3}-a^2\sqrt{a^2-u^2}+C$

190. $\int \frac{du}{u\sqrt{a^2-u^2}} = -\frac{1}{a}\ln\left(\frac{a+\sqrt{a^2-u^2}}{u}\right)+C$

191. $\int \frac{du}{u^2\sqrt{a^2-u^2}} = -\frac{\sqrt{a^2-u^2}}{a^2u}+C$

192. $\int \frac{du}{u^3\sqrt{a^2-u^2}} = -\frac{\sqrt{a^2-u^2}}{2a^2u^2}-\frac{1}{2a^3}\ln\left(\frac{a+\sqrt{a^2-u^2}}{u}\right)+C$

193. $\int \sqrt{a^2-u^2}du = \frac{u\sqrt{a^2-u^2}}{2}+\frac{a^2}{2}\operatorname{sen}^{-1}\left(\frac{u}{a}\right)+C$

194. $\int u\sqrt{a^2-u^2}\,du = -\frac{\left(a^2-u^2\right)^{\frac{3}{2}}}{3}+C$

195. $\int u^2\sqrt{a^2-u^2}\,du = -\frac{u\left(a^2-u^2\right)^{\frac{3}{2}}}{4}+\frac{a^2u\sqrt{a^2-u^2}}{8}+\frac{a^4}{8}\operatorname{sen}^{-1}\left(\frac{u}{a}\right)+C$

196. $\int u^3\sqrt{a^2-u^2}\,du = \frac{\left(a^2-u^2\right)^{\frac{5}{2}}}{5}-\frac{a^2\left(a^2-u^2\right)^{\frac{3}{2}}}{3}+C$

197. $\int \frac{\sqrt{a^2-u^2}}{u}du = \sqrt{a^2-u^2}-a\ln\left(\frac{a+\sqrt{a^2-u^2}}{u}\right)+C$

198. $\int \frac{\sqrt{a^2-u^2}}{u^2}du = -\frac{\sqrt{a^2-u^2}}{u}-\operatorname{sen}^{-1}\left(\frac{u}{a}\right)+C$

199. $\int \frac{\sqrt{a^2-u^2}}{u^3}du = -\frac{\sqrt{a^2-u^2}}{2u^2}+\frac{1}{2a}\ln\left(\frac{a+\sqrt{a^2-u^2}}{u}\right)+C$

200. $\int \frac{du}{\left(a^2-u^2\right)^{\frac{3}{2}}} = \frac{u}{a^2\sqrt{a^2-u^2}}+C$

201. $\int \frac{u}{\left(a^2-u^2\right)^{\frac{3}{2}}}du = \frac{1}{\sqrt{a^2-u^2}}+C$

202. $\int \frac{u^2}{\left(a^2-u^2\right)^{\frac{3}{2}}}du = \frac{u}{\sqrt{a^2-u^2}}-\operatorname{sen}^{-1}\left(\frac{u}{a}\right)+C$

203. $\int \frac{u^3}{\left(a^2-u^2\right)^{\frac{3}{2}}}du = \sqrt{a^2-u^2}+\frac{a^2}{\sqrt{a^2-u^2}}+C$

204. $\int \frac{du}{u\left(a^2-u^2\right)^{\frac{3}{2}}} = \frac{1}{a^2\sqrt{a^2-u^2}}-\frac{1}{a^3}\ln\left(\frac{a+\sqrt{a^2-u^2}}{u}\right)+C$

205. $\int \frac{du}{u^2\left(a^2-u^2\right)^{\frac{3}{2}}} = -\frac{\sqrt{a^2-u^2}}{a^4u}+\frac{u}{a^4\sqrt{a^2-u^2}}+C$

206. $\int \frac{du}{u^3\left(a^2-u^2\right)^{\frac{3}{2}}} = -\frac{1}{2a^2u^2\sqrt{a^2-u^2}} + \frac{3}{2a^4\sqrt{a^2-u^2}} - \frac{3}{2a^5} \ln\left(\frac{a+\sqrt{a^2-u^2}}{u}\right) + C$

207. $\int \left(a^2-u^2\right)^{\frac{3}{2}} du = \frac{u\left(a^2-u^2\right)^{\frac{3}{2}}}{4} + \frac{3a^2u\sqrt{a^2-u^2}}{8} + \frac{3}{8}a^4 \operatorname{sen}\left(\frac{u}{a}\right) + C$

208. $\int u\left(a^2-u^2\right)^{\frac{3}{2}} du = -\frac{\left(a^2-u^2\right)^{\frac{5}{2}}}{5} + C$

209. $\int u^2\left(a^2-u^2\right)^{\frac{3}{2}} du = -\frac{u\left(a^2-u^2\right)^{\frac{5}{2}}}{6} + \frac{a^2u\left(a^2-u^2\right)^{\frac{3}{2}}}{24} + \frac{a^4u\sqrt{a^2-u^2}}{16} + \frac{a^6}{16}\operatorname{sen}^{-1}\left(\frac{u}{a}\right) + C$

210. $\int u^3\left(a^2-u^2\right)^{\frac{3}{2}} du = \frac{\left(a^2-u^2\right)^{\frac{7}{2}}}{7} - \frac{a^2\left(a^2-u^2\right)^{\frac{5}{2}}}{5} + C$

211. $\int \frac{\left(a^2-u^2\right)^{\frac{3}{2}}}{u} du = \frac{\left(a^2-u^2\right)^{\frac{3}{2}}}{3} + a^2\sqrt{a^2-u^2} - a^3 \ln\left(\frac{a+\sqrt{a^2-u^2}}{u}\right) + C$

212. $\int \frac{\left(a^2-u^2\right)^{\frac{3}{2}}}{u^2} du = -\frac{\left(a^2-u^2\right)^{\frac{3}{2}}}{u} - \frac{3u\sqrt{a^2-u^2}}{2} + \frac{3}{2}a^2\operatorname{sen}\left(\frac{u}{a}\right) + C$

213. $\int \frac{\left(a^2-u^2\right)^{\frac{3}{2}}}{u^3} du = -\frac{\left(a^2-u^2\right)^{\frac{3}{2}}}{2u^2} - \frac{3\sqrt{a^2-u^2}}{2} + \frac{3}{2}a \ln\left(\frac{a+\sqrt{a^2-u^2}}{u}\right) + C$

Fórmulas con $au^2 + bu + c$

214. $\int \frac{du}{au^2+bu+c} = \begin{cases} \frac{2}{\sqrt{4ac-b^2}} \tan^{-1}\left(\frac{2au+b}{\sqrt{4ac-b^2}}\right) + C \\ \frac{1}{\sqrt{b^2-4ac}} \ln\left(\frac{2au+b-\sqrt{b^2-4ac}}{2au+b+\sqrt{b^2-4ac}}\right) + C \end{cases}$

215. $\int \frac{u}{au^2+bu+c} du = \frac{1}{2a}\ln\left(au^2+bu+c\right) - \frac{b}{2a}\int \frac{du}{au^2+bu+c}$

216. $\int \frac{u^2}{au^2+bu+c} du = \frac{u}{a} - \frac{b}{2a^2}\ln\left(au^2+bu+c\right) + \frac{b^2-2ac}{2a^2}\int \frac{du}{au^2+bu+c}$

217. $\int \frac{du}{u\left(au^2+bu+c\right)} = \frac{1}{2c}\ln\left(\frac{u^2}{au^2+bu+c}\right) - \frac{b}{2c}\int \frac{du}{au^2+bu+c}$

218. $\int \frac{du}{u^2\left(au^2+bu+c\right)} = \frac{b}{2c^2}\ln\left(\frac{au^2+bu+c}{u^2}\right) - \frac{1}{cu} + \frac{b^2-2ac}{2c^2}\int \frac{du}{au^2+bu+c}$

219. $\int \frac{du}{\left(au^2+bu+c\right)^2} = \frac{2au+b}{\left(4ac-b^2\right)\left(au^2+bu+c\right)} + \frac{2a}{4ac-b^2}\int \frac{du}{au^2+bu+c}$

220. $\int \frac{u}{\left(au^2+bu+c\right)^2} du = -\frac{bu+2c}{\left(4ac-b^2\right)\left(au^2+bu+c\right)} - \frac{b}{4ac-b^2}\int \frac{du}{au^2+bu+c}$

221. $\int \frac{u^2}{\left(au^2+bu+c\right)^2} du = \frac{\left(b^2-2ac\right)u+bc}{a\left(4ac+b^2\right)\left(au^2+bu+c\right)} + \frac{2c}{4ac-b^2}\int \frac{du}{au^2+bu+c}$

222. $\int \frac{du}{u\left(au^2+bu+c\right)^2} = \frac{1}{2c\left(au^2+bu+c\right)} - \frac{b}{2c}\int \frac{du}{\left(au^2+bu+c\right)^2} + \frac{1}{c}\int \frac{du}{u\left(au^2+bu+c\right)}$

223. $\int \frac{du}{u^2\left(au^2+bu+c\right)^2} = -\frac{1}{cu\left(au^2+bu+c\right)} - \frac{3a}{c}\int \frac{du}{\left(au^2+bu+c\right)^2} - \frac{2b}{c}\int \frac{du}{u\left(au^2+bu+c\right)^2}$

224. $\int \frac{u^m}{au^2+bu+c} du = \frac{u^{m-1}}{a(m-1)} - \frac{c}{a}\int \frac{u^{m-2}}{au^2+bu+c} du - \frac{b}{a}\int \frac{u^{m-1}}{au^2+bu+c} du$

225. $\int \frac{du}{u^n\left(au^2+bu+c\right)} = -\frac{1}{c(n-1)u^{n-1}} - \frac{b}{c}\int \frac{du}{u^{n-1}\left(au^2+bu+c\right)} - \frac{a}{c}\int \frac{du}{u^{n-2}\left(au^2+bu+c\right)}$

Fórmulas con $u^3 + a^3$

226. $\int \frac{du}{u^3+a^3} = \frac{1}{6a^2}\ln\left(\frac{(a+u)^2}{u^2-au+a^2}\right) + \frac{1}{a^2\sqrt{3}}\tan^{-1}\left(\frac{2u-a}{a\sqrt{3}}\right) + C$

227. $\int \frac{u}{u^3+a^3} du = \frac{1}{6a}\ln\left(\frac{u^2-au+a^2}{(u+a)^2}\right) + \frac{1}{a\sqrt{3}}\tan^{-1}\left(\frac{2u-a}{a\sqrt{3}}\right) + C$

228. $\int \frac{u^2}{u^3+a^3} du = \frac{1}{3}\ln\left(u^3+a^3\right) + C$

229. $\int \frac{du}{u\left(u^3+a^3\right)} = \frac{1}{3a^3}\ln\left(\frac{u^3}{u^3+a^3}\right)+C$

230. $\int \frac{du}{u^2\left(u^3+a^3\right)} = -\frac{1}{a^3u} - \frac{1}{6a^4}\ln\left(\frac{u^2-au+a^2}{(u+a)^2}\right) - \frac{1}{a^4\sqrt{3}}\tan^{-1}\left(\frac{2u-a}{a\sqrt{3}}\right)+C$

231. $\int \frac{du}{\left(u^3+a^3\right)^2} = \frac{u}{3a^3\left(u^3+a^3\right)} + \frac{1}{9a^5}\ln\left(\frac{(u+a)^2}{u^2-au+a^2}\right) + \frac{2}{3a^5\sqrt{3}}\tan^{-1}\left(\frac{2u-a}{a\sqrt{3}}\right)+C$

232. $\int \frac{u}{\left(u^3+a^3\right)^2}du = \frac{u^2}{3a^5\left(u^3+a^3\right)} + \frac{1}{18a^4}\ln\left(\frac{u^2-au+a^2}{(u+a)^2}\right) + \frac{1}{3a^4\sqrt{3}}\tan^{-1}\left(\frac{2u-a}{a\sqrt{3}}\right)+C$

233. $\int \frac{u^2}{\left(u^3+a^3\right)^2}du = -\frac{1}{3\left(u^3+a^3\right)}+C$

234. $\int \frac{du}{u\left(u^3+a^3\right)^2} = \frac{1}{3a^3\left(u^3+a^3\right)} + \frac{1}{3a^6}\ln\left(\frac{u^3}{u^3+a^3}\right)+C$

235. $\int \frac{du}{u^2\left(u^3+a^3\right)^2} = -\frac{1}{a^6u} - \frac{u^2}{3a^6\left(u^3+a^3\right)} - \frac{4}{3a^6}\int \frac{u}{u^3+a^3}du$

236. $\int \frac{u^m}{u^3+a^3}du = \frac{u^{m-2}}{m-2} - a^3\int \frac{u^{m-3}}{u^3+a^3}du$

237. $\int \frac{du}{u^n\left(u^3+a^3\right)} = -\frac{1}{a^3(n-1)u^{n-1}} - \frac{1}{a^3}\int \frac{du}{u^{n-3}\left(u^3+a^3\right)}$

Fórmulas con $u^4 \pm a^4$

238. $\int \frac{du}{u^4+a^4} = \frac{1}{4a^3\sqrt{2}}\ln\left(\frac{u^2+au\sqrt{2}+a^2}{u^2-au\sqrt{2}+a^2}\right) - \frac{1}{2a^3\sqrt{2}}\left[\tan^{-1}\left(1-\frac{u\sqrt{2}}{a}\right) - \tan^{-1}\left(1+\frac{u\sqrt{2}}{a}\right)\right]+C$

239. $\int \frac{u^2}{u^4+a^4}du = \frac{1}{4a\sqrt{2}}\ln\left(\frac{u^2-au\sqrt{2}+a^2}{u^2+au\sqrt{2}+a^2}\right) - \frac{1}{2a\sqrt{2}}\left[\tan^{-1}\left(1-\frac{u\sqrt{2}}{a}\right) - \tan^{-1}\left(1+\frac{u\sqrt{2}}{a}\right)\right]+C$

240. $\int \frac{du}{u^2\left(u^4+a^4\right)} = -\frac{1}{a^4u} - \frac{1}{4a^5\sqrt{2}}\ln\left(\frac{u^2-au\sqrt{2}+a^2}{u^2+au\sqrt{2}+a^2}\right) + \frac{1}{2a^5\sqrt{2}}\left[\tan^{-1}\left(1-\frac{u\sqrt{2}}{a}\right) - \tan^{-1}\left(1+\frac{u\sqrt{2}}{a}\right)\right]+C$

241. $\int \frac{u^3}{u^4+a^4}du = \frac{1}{4}\ln\left(u^4+a^4\right)+C$

242. $\int \frac{du}{u\left(u^4+a^4\right)} = \frac{1}{4a^2}\ln\left(\frac{u^4}{u^4+a^4}\right)+C$

243. $\int \frac{u}{u^4+a^4}du = \frac{1}{2a^2}\tan^{-1}\left(\frac{u^2}{a^2}\right)+C$

244. $\int \frac{du}{u^3\left(u^4+a^4\right)} = -\frac{1}{2a^4u^2} - \frac{1}{2a^6}\tan^{-1}\left(\frac{u^2}{a^2}\right)+C$

245. $\int \frac{du}{u^4-a^4} = \frac{1}{4a^3}\ln\left(\frac{u-a}{u+a}\right) - \frac{1}{2a^3}\tan^{-1}\left(\frac{u}{a}\right)+C$

246. $\int \frac{u}{u^4-a^4}du = \frac{1}{4a^2}\ln\left(\frac{u^2-a^2}{u^2+a^2}\right)+C$

247. $\int \frac{u^2}{u^4-a^4}du = \frac{1}{4a}\ln\left(\frac{u-a}{u+a}\right) + \frac{1}{2a}\tan^{-1}\left(\frac{u}{a}\right)+C$

248. $\int \frac{u^3}{u^4-a^4}du = \frac{1}{4}\ln\left(u^4-a^4\right)+C$

249. $\int \frac{du}{u\left(u^4-a^4\right)} = \frac{1}{4a^4}\ln\left(\frac{u^4-a^4}{u^4}\right)+C$

250. $\int \frac{du}{u^2\left(u^4-a^4\right)} = \frac{1}{a^4u} + \frac{1}{4a^5}\ln\left(\frac{u-a}{u+a}\right) + \frac{1}{2a^5}\tan^{-1}\left(\frac{u}{a}\right)+C$

251. $\int \frac{du}{u^3\left(u^4-a^4\right)} = \frac{1}{2a^4u^2} + \frac{1}{4a^6}\ln\left(\frac{u^2-a^2}{u^2+a^2}\right)+C$

Fórmulas con sen (au)

252. $\int \operatorname{sen}(au)du = -\frac{\cos(au)}{a}+C$

253. $\int u\operatorname{sen}(au)du = \frac{\operatorname{sen}(au)}{a^2} - \frac{u\cos(au)}{a}+C$

254. $\int u^2\operatorname{sen}(au)du = \frac{2u}{a^2}\operatorname{sen}(au) + \left(\frac{2}{a^3}-\frac{u^2}{a}\right)\cos(au)+C$

255. $\int u^3\operatorname{sen}(au)du = \left(\frac{3u^2}{a^2}-\frac{6}{a^4}\right)\operatorname{sen}(au) + \left(\frac{6u}{a^3}-\frac{u^3}{a}\right)\cos(au)+C$

256. $\int u^n\operatorname{sen}(au)du = -\frac{u^n\cos(au)}{a} + \frac{n}{a}\int u^{n-1}\cos(au)du$

257. $\int u^n\operatorname{sen}(au)du = -\frac{u^n\cos(au)}{a} + \frac{nu^{n-1}}{a^2}\operatorname{sen}(au) - \frac{n(n-1)}{a^2}\int u^{n-2}\operatorname{sen}(au)du$

258. $\int \operatorname{sen}^2(au)du = \frac{u}{2} - \frac{\operatorname{sen}(2au)}{4a}+C$

259. $\int \operatorname{sen}^3(au)du = -\frac{\cos(au)}{a} + \frac{\cos^3(au)}{3a} + C$

260. $\int \operatorname{sen}^4(au)du = \frac{3u}{8} - \frac{\operatorname{sen}(2au)}{4a} + \frac{\operatorname{sen}(4au)}{32a} + C$

261. $\int u\operatorname{sen}^2(au)du = \frac{u^2}{4} - \frac{u\operatorname{sen}(2au)}{4a} - \frac{\cos(au)}{8a^2} + C$

262. $\int \frac{\operatorname{sen}(au)}{u}du = au - \frac{(au)^3}{3\cdot 3!} + \frac{(au)^5}{5\cdot 5!} - \ldots$

263. $\int \frac{\operatorname{sen}(au)}{u^2}du = -\frac{\operatorname{sen}(au)}{u} + a\int \frac{\cos(au)}{u}du$

264. $$\int \frac{du}{\operatorname{sen}(au)} = \begin{cases} \frac{1}{a}\ln\left(\csc(au) - \cot(au)\right) + C \\ \frac{1}{a}\ln\left(\tan\left(\frac{au}{2}\right)\right) + C \end{cases}$$

265. $$\int \frac{u}{\operatorname{sen}(au)}du = \frac{1}{a^2}\left\{au + \frac{(au)^3}{18} + \frac{7(au)^5}{1800} + \ldots + \frac{2\left(2^{2n-1}-1\right)B_n(au)^{2n+1}}{(2n+1)!} + \ldots\right\}$$

266. $\int \frac{du}{\operatorname{sen}^2(au)} = -\frac{1}{a}\cot(au) + C$

267. $\int \frac{du}{\operatorname{sen}^3(au)} = -\frac{\cos(au)}{2a\operatorname{sen}^2(au)} + \frac{1}{2a}\ln\left[\tan\left(\frac{au}{2}\right)\right] + C$

268. $\int \operatorname{sen}(au)\operatorname{sen}(bu)du = \frac{\operatorname{sen}\left((a-b)u\right)}{2(a-b)} - \frac{\operatorname{sen}\left((a+b)u\right)}{2(a+b)} + C \quad a \neq b$

269. $\int \frac{du}{1-\operatorname{sen}(au)} = \frac{1}{a}\tan\left(\frac{\pi}{4} + \frac{au}{2}\right) + C$

270. $\int \frac{u}{1-\operatorname{sen}(au)}du = \frac{u}{a}\tan\left(\frac{\pi}{4} + \frac{au}{2}\right) + \frac{2}{a^2}\ln\left[\operatorname{sen}\left(\frac{\pi}{4} + \frac{au}{2}\right)\right] + C$

271. $\int \frac{du}{1+\operatorname{sen}(au)} = -\frac{1}{a}\tan\left(\frac{\pi}{4} - \frac{au}{2}\right) + C$

272. $\int \frac{u}{1+\operatorname{sen}(au)}du = -\frac{u}{a}\tan\left(\frac{\pi}{4} - \frac{au}{2}\right) + \frac{2}{a^2}\ln\left[\operatorname{sen}\left(\frac{\pi}{4} + \frac{au}{2}\right)\right] + C$

273. $\int \frac{du}{\left(1-\operatorname{sen}(au)\right)^2} = \frac{1}{2a}\tan\left(\frac{\pi}{4} + \frac{au}{2}\right) + \frac{1}{6a}\tan^3\left(\frac{\pi}{4} + \frac{au}{2}\right) + C$

274. $\int \frac{du}{\left(1+\operatorname{sen}(au)\right)^2} = -\frac{1}{2a}\tan\left(\frac{\pi}{4} - \frac{au}{2}\right) - \frac{1}{6a}\tan^3\left(\frac{\pi}{4} - \frac{au}{2}\right) + C$

Fórmulas con $\cos(au)$

275. $\int \cos(au)du = \frac{\operatorname{sen}(au)}{a} + C$

276. $\int u\cos(au)du = \frac{\cos(au)}{a^2} + \frac{u\operatorname{sen}(au)}{a} + C$

277. $\int u^2\cos(au)du = \frac{2u}{a^2}\cos(au) + \left(\frac{u^2}{a} - \frac{2}{a^3}\right)\operatorname{sen}(au) + C$

278. $\int u^3\cos(au)du = \left(\frac{3u^2}{a^2} - \frac{6}{a^4}\right)\cos(au) + \left(\frac{u^3}{a} - \frac{6u}{a^3}\right)\operatorname{sen}(au) + C$

279. $\int u^n\cos(au)du = \frac{u^n\operatorname{sen}(au)}{a} - \frac{n}{a}\int u^{n-1}\operatorname{sen}(au)du$

280. $\int u^n\cos(au)du = -\frac{u^n\operatorname{sen}(au)}{a} + \frac{nu^{n-1}}{a^2}\cos(au) - \frac{n(n-1)}{a^2}\int u^{n-2}\cos(au)du$

281. $\int \cos^2(au)du = \frac{u}{2} + \frac{\operatorname{sen}(2au)}{4a} + C$

282. $\int \cos^3(au)du = \frac{\operatorname{sen}(au)}{a} - \frac{\operatorname{sen}^3(au)}{3a} + C$

283. $\int \cos^4(au)du = \frac{3u}{8} + \frac{\operatorname{sen}(2au)}{4a} + \frac{\operatorname{sen}(4au)}{32a} + C$

284. $\int u\cos^2(au)du = \frac{u^2}{4} + \frac{u\operatorname{sen}(2au)}{4a} + \frac{\cos(2au)}{8a^2} + C$

285. $\int \frac{\cos(au)}{u}du = \ln(u) - \frac{(au)^2}{2\cdot 2!} + \frac{(au)^4}{4\cdot 4!} - \frac{(au)^6}{6\cdot 6!} + \ldots$

286. $\int \frac{\cos(au)}{u^2}du = -\frac{\cos(au)}{u} - a\int \frac{\operatorname{sen}(au)}{u}du$

287. $$\int \frac{du}{\cos(au)} = \begin{cases} \frac{1}{a}\ln\left[\sec(au) + \tan(au)\right] + C \\ \frac{1}{a}\ln\left[\tan\left(\frac{\pi}{4} + \frac{au}{2}\right)\right] + C \end{cases}$$

288. $$\int \frac{u}{\cos(au)}du = \frac{1}{a^2}\left\{\frac{(au)^2}{2} + \frac{(au)^4}{8} + \frac{5(au)^6}{144} + \ldots + \frac{E_n(au)^{2n+2}}{(2n+2)(2n)!} + \ldots\right\}$$

289. $\int \frac{du}{\cos^2(au)} = \frac{\tan(au)}{a} + C$

290. $\int \frac{du}{\cos^3(au)} = \frac{\operatorname{sen}(au)}{2a\cos^2(au)} + \frac{1}{2a}\ln\left[\tan\left(\frac{\pi}{4} + \frac{au}{2}\right)\right] + C$

291. $\int \cos(au)\cos(bu)du = \dfrac{\operatorname{sen}((a-b)u)}{2(a-b)} - \dfrac{\operatorname{sen}((a+b)u)}{2(a+b)} + C \quad a \neq b$

292. $\int \dfrac{du}{1-\cos(au)} = -\dfrac{1}{a}\cot\left(\dfrac{au}{2}\right) + C$

293. $\int \dfrac{u}{1-\cos(au)}du = -\dfrac{u}{a}\cot\left(\dfrac{au}{2}\right) + \dfrac{2}{a^2}\ln\left[\operatorname{sen}\left(\dfrac{au}{2}\right)\right] + C$

294. $\int \dfrac{du}{1+\cos(au)} = \dfrac{1}{a}\tan\left(\dfrac{au}{2}\right) + C$

295. $\int \dfrac{u}{1+\cos(au)}du = \dfrac{u}{a}\tan\left(\dfrac{au}{2}\right) + \dfrac{2}{a^2}\ln\left[\cos\left(\dfrac{au}{2}\right)\right] + C$

296. $\int \dfrac{du}{(1-\cos(au))^2} = -\dfrac{1}{2a}\cot\left(\dfrac{au}{2}\right) - \dfrac{1}{6a}\cot^3\left(\dfrac{au}{2}\right) + C$

297. $\int \dfrac{du}{(1+\cos(au))^2} = \dfrac{1}{2a}\tan\left(\dfrac{au}{2}\right) + \dfrac{1}{6a}\tan^3\left(\dfrac{au}{2}\right) + C$

Fórmulas con cos (*au*) y sen (*au*)

298. $\int \operatorname{sen}(au)\cos(au)du = \dfrac{\operatorname{sen}^2(au)}{2a} + C$

299. $\int \operatorname{sen}(pu)\cos(qu)du = -\dfrac{\cos[(p-q)u]}{2(p-q)} - \dfrac{\cos[(p+q)u]}{2(p+q)} + C$

300. $\int \operatorname{sen}^n(au)\cos(au)du = \dfrac{\operatorname{sen}^{n+1}(au)}{a(n+1)} + C$

301. $\int \cos^n(au)\operatorname{sen}(au)du = -\dfrac{\cos^{n+1}(au)}{a(n+1)} + C$

302. $\int \operatorname{sen}^2(au)\cos^2(au)du = \dfrac{u}{8} - \dfrac{\operatorname{sen}(4au)}{32a} + C$

303. $\int \dfrac{du}{\operatorname{sen}(au)\cos(au)} = \dfrac{1}{a}\ln[\tan(au)] + C$

304. $\int \dfrac{du}{\operatorname{sen}^2(au)\cos(au)} = \dfrac{1}{a}\ln\left[\tan\left(\dfrac{\pi}{4}+\dfrac{au}{2}\right)\right] - \dfrac{1}{a\operatorname{sen}(au)} + C$

305. $\int \dfrac{du}{\operatorname{sen}(au)\cos^2(au)} = \dfrac{1}{a}\ln\left[\tan\left(\dfrac{au}{2}\right)\right] + \dfrac{1}{a\cos(au)} + C$

306. $\int \dfrac{du}{\operatorname{sen}^2(au)\cos^2(au)} = -\dfrac{2\cot(2au)}{a} + C$

307. $\int \dfrac{\operatorname{sen}^2(au)}{\cos(au)}du = -\dfrac{\operatorname{sen}(au)}{a} + \dfrac{1}{a}\ln\left[\tan\left(\dfrac{\pi}{4}+\dfrac{au}{2}\right)\right] + C$

308. $\int \dfrac{\cos^2(au)}{\operatorname{sen}(au)}du = \dfrac{\cos(au)}{a} + \dfrac{1}{a}\ln\left[\tan\left(\dfrac{au}{2}\right)\right] + C$

309. $\int \dfrac{du}{\operatorname{sen}(au)\pm\cos(au)} = \dfrac{1}{a\sqrt{2}}\ln\left[\tan\left(\dfrac{\pi}{8}\pm\dfrac{au}{2}\right)\right] + C$

310. $\int \dfrac{\operatorname{sen}(au)}{\operatorname{sen}(au)\pm\cos(au)}du = \dfrac{u}{2} \mp \dfrac{1}{2a}\ln[\operatorname{sen}(au)\pm\cos(au)] + C$

311. $\int \dfrac{\cos(au)}{\operatorname{sen}(au)\pm\cos(au)}du = \dfrac{1}{2a}\ln[\operatorname{sen}(au)\pm\cos(au)] \pm \dfrac{u}{2} + C$

Fórmulas con tan (*au*)

312. $\int \tan(au)du = \begin{cases} -\dfrac{1}{a}\ln[\cos(au)] + C \\ \dfrac{1}{a}\ln[\sec(au)] + C \end{cases}$

313. $\int \tan^2(au)du = \dfrac{\tan(au)}{a} - u + C$

314. $\int \tan^3(au)du = \dfrac{\tan^2(au)}{2a} + \dfrac{1}{a}\ln[\cos(au)] + C$

315. $\int \tan^n(au)du = \dfrac{\tan^{n-1}(au)}{a(n-1)} - \int \tan^{n-2}(au)du$

316. $\int \tan^n(au)\sec^2(au)du = \dfrac{\tan^{n+1}(au)}{a(n+1)} + C$

317. $\int \dfrac{\sec^2(au)}{\tan(au)}du = \dfrac{1}{a}\ln[\tan(au)] + C$

318. $\int \dfrac{du}{\tan(au)} = \dfrac{1}{a}\ln[\operatorname{sen}(au)] + C$

319. $\int u\tan^2(au)du = \dfrac{u\tan(au)}{a} + \dfrac{1}{a^2}\ln[\cos(au)] - \dfrac{u^2}{2} + C$

Fórmulas con cot (*au*)

320. $\int \cot(au)du = \dfrac{1}{a}\ln[\operatorname{sen}(au)] + C$

321. $\int \cot^2(au)du = -\dfrac{\cot(au)}{a} - u + C$

322. $\int \cot^3(au)du = -\dfrac{\cot^2(au)}{2a} - \dfrac{1}{a}\ln[\operatorname{sen}(au)] + C$

323. $\int \cot^n(au)\csc^2(au)du = -\dfrac{\cot^{n-1}(au)}{a(n+1)} + C$

324. $\int \dfrac{\csc^2(au)}{\cot(au)}du = -\dfrac{1}{a}\ln[\cot(au)] + C$

325. $\int \frac{du}{\cot(au)} = -\frac{1}{a}\ln\left[\cos(au)\right] + C$

326. $\int u\cot^2(au)du = -\frac{u\cot(au)}{a} + \frac{1}{a^2}\ln\left[\operatorname{sen}(au)\right] - \frac{u^2}{2} + C$

327. $\int \cot^n(au)du = -\frac{\cot^{n-1}(au)}{a(n-1)} - \int \cot^{n-2}(au)du$

Fórmulas con sec (*au*)

328. $\int \sec(au)du = \begin{cases} \frac{1}{a}\ln\left[\sec(au)+\tan(au)\right]+C \\ \frac{1}{a}\ln\left[\tan\left(\frac{\pi}{4}+\frac{au}{2}\right)\right]+C \end{cases}$

329. $\int \sec^2(au)du = \frac{\tan(au)}{a} + C$

330. $\int \sec^3(au)du = \frac{\sec(au)\tan(au)}{2a} + \frac{1}{2a}\ln\left[\sec(au)+\tan(au)\right] + C$

331. $\int \sec^n(au)\tan(au)du = \frac{\sec^n(au)}{an} + C$

332. $\int \frac{du}{\sec(au)} = \frac{\operatorname{sen}(au)}{a} + C$

333. $\int u\sec^2(au)du = \frac{u}{a}\tan(au) + \frac{1}{a^2}\ln\left[\cos(au)\right] + C$

334. $\int \sec^n(au)du = \frac{\sec^{n-2}(au)\tan(au)}{a(n-1)} + \frac{n-2}{n-1}\int \sec^{n-2}(au)du$

Fórmulas con csc (*au*)

335. $\int \csc(au)du = \begin{cases} \frac{1}{a}\ln\left[\csc(au)-\cot(au)\right]+C \\ \frac{1}{a}\ln\left[\tan\left(\frac{au}{2}\right)\right]+C \end{cases}$

336. $\int \csc^2(au)du = -\frac{\cot(au)}{a} + C$

337. $\int \csc^3(au)du = -\frac{\csc(au)\cot(au)}{2a} + \frac{1}{2a}\ln\left[\tan\left(\frac{au}{2}\right)\right] + C$

338. $\int \csc^n(au)\cot(au)du = -\frac{\csc^n(au)}{na} + C$

339. $\int \frac{du}{\csc(au)} = -\frac{\cos(au)}{a} + C$

340. $\int u\csc^2(au)du = -\frac{u\cot(au)}{a} + \frac{1}{a^2}\ln\left[\operatorname{sen}(au)\right] + C$

341. $\int \csc^n(au)du = -\frac{\csc^{n-2}(au)\cot(au)}{a(n-1)} + \frac{n-2}{n-1}\int \csc^{n-2}(au)du$

Fórmulas con funciones trigonométricas inversas

342. $\int \operatorname{sen}^{-1}\left(\frac{u}{a}\right)du = u\operatorname{sen}^{-1}\left(\frac{u}{a}\right) + \sqrt{a^2-u^2} + C$

343. $\int u\operatorname{sen}^{-1}\left(\frac{u}{a}\right)du = \left(\frac{u^2}{2}-\frac{a^2}{4}\right)\operatorname{sen}^{-1}\left(\frac{u}{a}\right) + \frac{u\sqrt{a^2-u^2}}{4} + C$

344. $\int u^2\operatorname{sen}^{-1}\left(\frac{u}{a}\right)du = \frac{u^3}{3}\operatorname{sen}^{-1}\left(\frac{u}{a}\right) + \frac{\left(u^2+2a^2\right)\sqrt{a^2-u^2}}{9} + C$

345. $\int \frac{\operatorname{sen}^{-1}\left(\frac{u}{a}\right)}{u}du = \frac{u}{a} + \frac{\left(\frac{u}{a}\right)^3}{2\cdot 3\cdot 3} + \frac{1\cdot 3\left(\frac{u}{a}\right)^5}{2\cdot 4\cdot 5\cdot 5} + \frac{1\cdot 3\cdot 5\left(\frac{u}{a}\right)^7}{2\cdot 4\cdot 6\cdot 7\cdot 7} + \cdots$

346. $\int \frac{\operatorname{sen}^{-1}\left(\frac{u}{a}\right)}{u^2}du = -\frac{\operatorname{sen}^{-1}\left(\frac{u}{a}\right)}{u} - \frac{1}{a}\ln\left[\frac{a+\sqrt{a^2-u^2}}{u}\right] + C$

347. $\int\left[\operatorname{sen}^{-1}\left(\frac{u}{a}\right)\right]^2 dx = u\left(\operatorname{sen}^{-1}\left(\frac{u}{a}\right)\right)^2 - 2u + 2\sqrt{a^2-a^2}\operatorname{sen}^{-1}\left(\frac{u}{a}\right) + C$

348. $\int \cos^{-1}\left(\frac{u}{a}\right)du = u\cos^{-1}\left(\frac{u}{a}\right) - \sqrt{a^2-u^2} + C$

349. $\int u\cos^{-1}\left(\frac{u}{a}\right)du = \left(\frac{u^2}{2}-\frac{a^2}{4}\right)\cos^{-1}\left(\frac{u}{a}\right) - \frac{u\sqrt{a^2-u^2}}{4} + C$

350. $\int u^2\cos^{-1}\left(\frac{u}{a}\right)du = \frac{u^3}{3}\cos^{-1}\left(\frac{u}{a}\right) - \frac{\left(u^2-2a^2\right)\left(\sqrt{a^2-u^2}\right)}{9} + C$

351. $\int \frac{\cos^{-1}\left(\frac{u}{a}\right)}{u}du = \frac{\pi}{2}\ln(u) - \int \frac{\operatorname{sen}^{-1}\left(\frac{u}{a}\right)}{u}du$

352. $\int \frac{\cos^{-1}\left(\frac{u}{a}\right)}{u^2}du = -\frac{\cos^{-1}\left(\frac{u}{a}\right)}{u} + \frac{1}{a}\ln\left(\frac{a+\sqrt{a^2-u^2}}{u}\right) + C$

353. $\int\left[\cos^{-1}\left(\frac{u}{a}\right)\right]^2 du = u\left(\cos^{-1}\left(\frac{u}{a}\right)\right)^2 - 2u - 2\sqrt{a^2-u^2}\cos^{-1}\left(\frac{u}{a}\right) + C$

354. $\int \tan^{-1}\left(\frac{u}{a}\right)du = u\tan^{-1}\left(\frac{u}{a}\right) - \frac{a}{2}\ln\left(u^2+a^2\right) + C$

355. $\int u\tan^{-1}\left(\frac{u}{a}\right)du=\frac{1}{2}\left(u^2+a^2\right)\tan^{-1}\left(\frac{u}{a}\right)-\frac{au}{2}+C$

356. $\int u^2\tan^{-1}\left(\frac{u}{a}\right)du=\frac{u^3}{3}\tan^{-1}\left(\frac{u}{a}\right)-\frac{au^2}{6}+\frac{a^3}{6}\ln\left(u^2+a^2\right)+C$

357. $\int\frac{\tan^{-1}\left(\frac{u}{a}\right)}{u}du=\frac{u}{a}-\frac{\left(\frac{u}{a}\right)^3}{3^2}+\frac{\left(\frac{u}{a}\right)^5}{5^2}-\frac{\left(\frac{u}{a}\right)^7}{7^2}+\cdots$

358. $\int\frac{\tan^{-1}\left(\frac{u}{a}\right)}{u^2}du=-\frac{u}{a}\tan^{-1}\left(\frac{u}{a}\right)-\frac{1}{2a}\ln\left(\frac{u^2+a^2}{u^2}\right)+C$

359. $\int\cot^{-1}\left(\frac{u}{a}\right)du=u\cot^{-1}\left(\frac{u}{a}\right)+\frac{a}{2}\ln\left(u^2+a^2\right)+C$

360. $\int u\cot^{-1}\left(\frac{u}{a}\right)du=\frac{1}{2}\left(u^2+a^2\right)\cot^{-1}\left(\frac{u}{a}\right)+\frac{au}{2}+C$

361. $\int u^2\cot^{-1}\left(\frac{u}{a}\right)du=\frac{u^3}{3}\cot^{-1}\left(\frac{u}{a}\right)+\frac{au^2}{6}-\frac{a^3}{6}\ln\left(u^2+a^2\right)+C$

362. $\int\frac{\cot^{-1}\left(\frac{u}{a}\right)}{u}du=\frac{\pi}{2}\ln(u)-\int\frac{\tan^{-1}\left(\frac{u}{a}\right)}{u}du$

363. $\int\frac{\cot^{-1}\left(\frac{u}{a}\right)}{u^2}du=-\frac{\cot^{-1}\left(\frac{u}{a}\right)}{u}+\frac{1}{2a}\ln\left(\frac{u^2+a^2}{u^2}\right)+C$

364. $\int u^m\text{sen}^{-1}\left(\frac{u}{a}\right)du=\frac{u^{m+1}}{m+1}\text{sen}^{-1}\left(\frac{u}{a}\right)-\frac{1}{m+1}\int\frac{u^{m+1}}{\sqrt{a^2-u^2}}du$

365. $\int u^m\cos^{-1}\left(\frac{u}{a}\right)du=\frac{u^{m+1}}{m+1}\cos^{-1}\left(\frac{u}{a}\right)+\frac{1}{m+1}\int\frac{u^{m+1}}{\sqrt{a^2-u^2}}du$

366. $\int u^m\tan^{-1}\left(\frac{u}{a}\right)du=\frac{u^{m+1}}{m+1}\tan^{-1}\left(\frac{u}{a}\right)-\frac{a}{m+1}\int\frac{u^{m+1}}{u^2+a^2}du$

367. $\int u^m\cot^{-1}\left(\frac{u}{a}\right)du=\frac{u^{m+1}}{m+1}\cot^{-1}\left(\frac{u}{a}\right)+\frac{a}{m+1}\int\frac{u^{m+1}}{u^2+a^2}du$

Fórmulas con e^{au}

368. $\int e^{au}\,du=\frac{e^{au}}{a}+C$

369. $\int ue^{au}\,du=\frac{e^{au}}{a}\left(u-\frac{1}{a}\right)+C$

370. $\int u^2e^{au}\,du=\frac{e^{au}}{a}\left(u^2-\frac{2u}{a}+\frac{2}{a^2}\right)+C$

371.
$$\int u^ne^{au}\,du=\begin{cases}\dfrac{u^ne^{au}}{a}-\dfrac{n}{a}\displaystyle\int u^{n-1}e^{au}\,du\\[2ex]\dfrac{e^{au}}{a}\left(u^n-\dfrac{nu^{n-1}}{a}+\dfrac{n(n-1)u^{n-2}}{a^2}+\cdots+\dfrac{(-1)^n\,n!}{a^n}\right)+C\quad\forall n=\mathbb{N}\end{cases}$$

372. $\int\frac{e^{au}}{u}du=\ln(u)+\frac{au}{1\cdot1!}+\frac{(au)^2}{2\cdot2!}+\frac{(au)^3}{3\cdot3!}+\cdots$

373. $\int\frac{e^{au}}{u^n}du=-\frac{e^{au}}{(n-1)u^{n-1}}+\frac{a}{n-1}\int\frac{e^{au}}{u^{n-1}}du$

374. $\int\frac{du}{p+pe^{au}}=\frac{u}{p}-\frac{1}{ap}\ln\left(p+qe^{au}\right)+C$

375. $\int\frac{du}{\left(p+qe^{au}\right)^2}=\frac{u}{p^2}+\frac{1}{ap\left(p+qe^{au}\right)}-\frac{1}{ap^2}\ln\left(p+qe^{au}\right)+C$

376.
$$\int\frac{du}{pe^{au}+qe^{-au}}=\begin{cases}\dfrac{1}{a\sqrt{pq}}\tan^{-1}\left(\sqrt{\dfrac{p}{q}}e^{au}\right)+C\\[2ex]\dfrac{1}{2a\sqrt{-pq}}\ln\left(\dfrac{e^{au}-\sqrt{-\frac{q}{p}}}{e^{au}+\sqrt{-\frac{q}{p}}}\right)+C\end{cases}$$

377. $\int e^{au}\text{sen}(bu)du=\frac{e^{au}\left[a\,\text{sen}(bu)-b\cos(bu)\right]}{a^2-b^2}+C$

378. $\int e^{au}\cos(bu)du=\frac{e^{au}\left[a\cos(bu)+b\,\text{sen}(bu)\right]}{a^2+b^2}+C$

379. $\int e^{au}\ln(u)du=\frac{e^{au}\ln(u)}{a}-\frac{1}{a}\int\frac{e^{au}}{u}du$

Fórmulas con $\ln(u)$

380. $\int\ln(u)du=u\ln(u)-u+C$

381. $\int\left[\ln(u)\right]^2du=u\left[\ln(u)\right]^2-2u\ln(u)+2u+C$

382. $\int\left[\ln(u)\right]^n du=u\left[\ln(u)\right]^n-n\int\left[\ln(u)\right]^{n-1}du$

383. $\int u\ln(u)du=\frac{u^2}{2}\left[\ln(u)-\frac{1}{2}\right]+C$

384. $\int u^m\ln(u)du=\frac{u^{m+1}}{m+1}\left(\ln(u)-\frac{1}{m+1}\right)+C$

385. $\int\frac{\ln(u)}{u}du=\frac{1}{2}\ln^2(u)+C$

386. $\int \frac{\ln(u)}{u^2}du = -\frac{\ln(u)}{u} - \frac{1}{u} + C$

387. $\int \ln^2(u)du = u\ln^2(u) - 2u\ln(u) + 2u + C$

388. $\int \frac{\ln^n(u)}{u}du = \frac{\ln^{n+1}(u)}{n+1} + C$

389. $\int \frac{du}{u\ln(u)} = \ln(\ln(u)) + C$

390. $\int \ln(u^2+a^2)du = u\ln(u^2+a^2) - 2u + 2a\tan^{-1}\left(\frac{u}{a}\right) + C$

391. $\int \ln(u^2-a^2)du = u\ln(u^2-a^2) - 2u + a\ln\left(\frac{u+a}{u-a}\right) + C$

Fórmulas con senh (au)

392. $\int \operatorname{senh}(au)du = \frac{1}{a}\cosh(au) + C$

393. $\int u\operatorname{senh}(au)du = \frac{u\cosh(au)}{a} - \frac{\operatorname{senh}(au)}{a^2} + C$

394. $\int u^2\operatorname{senh}(au)du = \left(\frac{u^2}{a} + \frac{2}{a^3}\right)\cosh(au) - \frac{2u}{a^2}\operatorname{senh}(au) + C$

395. $\int \frac{\operatorname{senh}(au)}{u}du = au + \frac{(au)^3}{3\cdot 3!} + \frac{(au)^5}{5\cdot 5!} + \cdots$

396. $\int \frac{\operatorname{senh}(au)}{u^2}du = -\frac{\operatorname{senh}(au)}{u} + a\int \cosh(au)du$

397. $\int \frac{du}{\operatorname{senh}(au)} = \frac{1}{a}\ln\left[\tanh\left(\frac{au}{2}\right)\right] + C$

398. $\int \operatorname{senh}^2(au)du = \frac{\operatorname{senh}(au)\cosh(au)}{2a} - \frac{u}{2} + C$

399. $\int u\operatorname{senh}^2(au)du = \frac{u\operatorname{senh}(2au)}{4a} - \frac{\cosh(2au)}{8a^2} - \frac{u^2}{4} + C$

400. $\int \frac{du}{\operatorname{senh}^2(au)} = -\frac{\coth(au)}{a} + C$

401. $\int \operatorname{senh}(pu)\operatorname{senh}(qu)du = \frac{\operatorname{senh}[(p+q)u]}{2(p+q)} - \frac{\operatorname{senh}[(p-q)u]}{2(p-q)} + C$

402. $\int u^m\operatorname{senh}(au)du = \frac{u^m\cosh(au)}{a} - \frac{m}{a}\int u^{m-1}\cosh(au)du$

403. $\int \operatorname{senh}^n(au)du = \frac{\operatorname{senh}^{n-1}(au)\cosh(au)}{an} - \frac{n-1}{n}\int \operatorname{senh}^{n-2}(au)du$

404. $\int \frac{\operatorname{senh}(au)}{u^n}du = -\frac{\operatorname{senh}(au)}{(n-1)u^{n-1}} + \frac{a}{n-1}\int \frac{\cosh(au)}{u^{n-1}}du$

405. $\int \frac{du}{\operatorname{senh}^n(au)} = -\frac{\cosh(au)}{a(n-1)\operatorname{senh}^{n-1}(au)} - \frac{n-2}{n-1}\int \frac{du}{\operatorname{senh}^{n-2}(au)}$

Fórmulas con cosh (au)

406. $\int \cosh(au)du = \frac{\operatorname{senh}(au)}{a} + C$

407. $\int u\cosh(au)du = \frac{u\operatorname{senh}(au)}{a} - \frac{\cosh(au)}{a^2} + C$

408. $\int u^2\cosh(au)du = -\frac{2u\cosh(au)}{a^2} + \left(\frac{u^2}{a} + \frac{2}{a^3}\right)\operatorname{senh}(au) + C$

409. $\int \frac{\cosh(au)}{u}du = \ln(u) + \frac{(au)^2}{2\cdot 2!} + \frac{(au)^4}{4\cdot 4!} + \frac{(au)^6}{6\cdot 6!} + \cdots$

410. $\int \frac{\cosh(au)}{u^2}du = -\frac{\cosh(au)}{u} + a\int \frac{\operatorname{senh}(au)}{u}du$

411. $\int \frac{du}{\cosh(au)} = \frac{2}{a}\tan^{-1}\left(e^{au}\right) + C$

412. $\int \cosh^2(au)du = \frac{u}{2} + \frac{\operatorname{senh}(au)\cosh(au)}{2a} + C$

413. $\int u\cosh^2(au)du = \frac{u^2}{4} + \frac{u\operatorname{senh}(2au)}{4a} - \frac{\cosh(2au)}{8a^2} + C$

414. $\int \frac{du}{\cosh^2(au)} = \frac{\tanh(au)}{a} + C$

415. $\int \cosh(pu)\cosh(qu)du = \frac{\operatorname{senh}[(p-q)u]}{2(p-q)} + \frac{\operatorname{senh}[(p+q)u]}{2(p+q)} + C$

416. $\int u^m\cosh(au)du = \frac{u^m\operatorname{senh}(au)}{a} - \frac{m}{a}\int u^{m-1}\operatorname{senh}(au)du$

417. $\int \cosh^n(au)du = \frac{\cosh^{n-1}(au)\operatorname{senh}(au)}{an} + \frac{n-1}{n}\int \cosh^{n-2}(au)du$

418. $\int \frac{\cosh(au)}{u^n}du = -\frac{\cosh(au)}{(n-1)u^{n-1}} + \frac{a}{n-1}\int \frac{\operatorname{senh}(au)}{u^{n-1}}du$

419. $\int \frac{du}{\cosh^n(au)} = \frac{\operatorname{senh}(au)}{a(n-1)\cosh^{n-1}(au)} + \frac{n-2}{n-1}\int \frac{du}{\cosh^{n-2}(au)}$

➟ Formulario B: Derivadas

En este formulario: c es una constante real, f, g y u son funciones derivables en x.

FÓRMULAS GENERALES

1. $\frac{d}{dx}(c) = 0$

2. $\frac{d}{dx}(cf(x)) = c\frac{d}{dx}(f(x))$

3. $\frac{d}{dx}[f(x) \pm g(x)] = f'(x) \pm g'(x)$

4. $\frac{d}{dx}[f(x)g(x)] = f(x)g'(x) + g(x)f'(x)$

5. $\frac{d}{dx}\left[\frac{f(x)}{g(x)}\right] = \frac{g(x)f'(x) - f(x)g'(x)}{[g(x)]^2}$

6. $\frac{d}{dx}[f(u)] = f'(u)\frac{du}{dx}$

7. $\frac{d}{dx}(u^n) = nu^{n-1}\frac{du}{dx}$

FUNCIONES TRIGONOMÉTRICAS

8. $\frac{d}{dx}(\operatorname{sen} x) = \cos x$

9. $\frac{d}{dx}(\cos x) = -\operatorname{sen} x$

10. $\frac{d}{dx}(\tan x) = \sec^2 x$

11. $\frac{d}{dx}(\cot x) = -\csc^2 x$

12. $\frac{d}{dx}(\sec x) = \sec x \tan x$

13. $\frac{d}{dx}(\csc x) = -\csc x \cot x$

14. $\frac{d}{dx}(\operatorname{sen} u) = \cos u\frac{du}{dx}$

15. $\frac{d}{dx}(\cos u) = -\operatorname{sen} u\frac{du}{dx}$

16. $\frac{d}{dx}(\tan u) = \sec^2 u\frac{du}{dx}$

17. $\frac{d}{dx}(\cot u) = -\csc^2 u\frac{du}{dx}$

18. $\frac{d}{dx}(\sec u) = \sec u \tan u\frac{du}{dx}$

19. $\frac{d}{dx}(\csc u) = -\csc u \cot u\frac{du}{dx}$

FUNCIONES LOGARÍTMICAS

20. $\frac{d}{dx}\left(e^x\right) = e^x$

21. $\frac{d}{dx}\left(a^x\right) = a^x \ln a$

22. $\frac{d}{dx}\left(\ln x\right) = \frac{1}{x}$

23. $\frac{d}{dx}\left(\log_a x\right) = \frac{1}{x \ln a}$

24. $\frac{d}{dx}\left(e^x\right) = e^x$

25. $\frac{d}{dx}\left(a^x\right) = a^x \ln a$

26. $\frac{d}{dx}\left(\ln x\right) = \frac{1}{x}$

27. $\frac{d}{dx}\left(\log_a x\right) = \frac{1}{x \ln a}$

FUNCIONES TRIGONOMÉTRICAS INVERSAS

28. $\frac{d}{dx}\left(\operatorname{sen}^{-1} x\right) = \frac{1}{\sqrt{1 - x^2}}$

29. $\frac{d}{dx}\left(\cos^{-1} x\right) = -\frac{1}{\sqrt{1 - x^2}}$

30. $\frac{d}{dx}\left(\tan^{-1} x\right) = \frac{1}{1 + x^2}$

31. $\frac{d}{dx}\left(\cot^{-1} x\right) = -\frac{1}{1 + x^2}$

32. $\frac{d}{dx}\left(\sec^{-1} x\right) = \frac{1}{x\sqrt{x^2 - 1}}$

33. $\frac{d}{dx}\left(\csc^{-1} x\right) = -\frac{1}{x\sqrt{x^2-1}}$

34. $\frac{d}{dx}\left(\text{sen}^{-1} u\right) = \frac{1}{\sqrt{1-u^2}}\frac{du}{dx}$

35. $\frac{d}{dx}\left(\cos^{-1} u\right) = -\frac{1}{\sqrt{1-u^2}}\frac{du}{dx}$

36. $\frac{d}{dx}\left(\tan^{-1} u\right) = \frac{1}{1+u^2}\frac{du}{dx}$

37. $\frac{d}{dx}\left(\cot^{-1} u\right) = -\frac{1}{1+u^2}\frac{du}{dx}$

38. $\frac{d}{dx}\left(\sec^{-1} u\right) = \frac{1}{u\sqrt{u^2-1}}\frac{du}{dx}$

39. $\frac{d}{dx}\left(\csc^{-1} u\right) = -\frac{1}{u\sqrt{u^2-1}}\frac{du}{dx}$

FUNCIONES HIPERBÓLICAS

40. $\frac{d}{dx}(\text{senh}\, x) = \cosh x$

41. $\frac{d}{dx}(\cosh x) = \text{senh}\, x$

42. $\frac{d}{dx}(\tanh x) = \text{sech}^2 x$

43. $\frac{d}{dx}(\coth x) = -\text{csch}^2 x$

44. $\frac{d}{dx}(\text{sech}\, hx) = -\text{sech}\, hx \tanh x$

45. $\frac{d}{dx}(\text{csch}\, hx) = -\text{csch}\, hx \coth x$

46. $\frac{d}{dx}(\text{senh}\, u) = \cosh u \frac{du}{dx}$

47. $\frac{d}{dx}(\cosh u) = \text{senh}\, u \frac{du}{dx}$

48. $\frac{d}{dx}(\tanh u) = \text{sech}^2 u \frac{du}{dx}$

49. $\frac{d}{dx}(\coth u) = -\text{csch}^2 u \frac{du}{dx}$

50. $\frac{d}{dx}(\text{sech}\, hu) = -\text{sech}\, hu \tanh u \frac{du}{dx}$

51. $\frac{d}{dx}(\text{csch}\, hu) = -\text{csch}\, hu \coth u \frac{du}{dx}$

FUNCIONES HIPERBÓLICAS INVERSAS

52. $\frac{d}{dx}\left(\text{senh}^{-1} x\right) = \frac{1}{\sqrt{1+x^2}}$

53. $\frac{d}{dx}\left(\cosh^{-1} x\right) = \frac{1}{\sqrt{x^2-1}}$

54. $\frac{d}{dx}\left(\tanh^{-1} x\right) = \frac{1}{1-x^2}$

55. $\frac{d}{dx}\left(\coth^{-1} x\right) = -\frac{1}{1-x^2}$

56. $\frac{d}{dx}\left(\text{sech}^{-1} x\right) = -\frac{1}{x\sqrt{1-x^2}}$

57. $\frac{d}{dx}\left(\text{csch}^{-1} x\right) = -\frac{1}{|x|\sqrt{x^2+1}}$

58. $\frac{d}{dx}\left(\text{senh}^{-1} u\right) = \frac{1}{\sqrt{1+u^2}}\frac{du}{dx}$

59. $\frac{d}{dx}\left(\cosh^{-1} u\right) = \frac{1}{\sqrt{u^2-1}}\frac{du}{dx}$

60. $\frac{d}{dx}\left(\tanh^{-1} u\right) = \frac{1}{1-u^2}\frac{du}{dx}$

61. $\frac{d}{dx}\left(\coth^{-1} u\right) = -\frac{1}{1-u^2}\frac{du}{dx}$

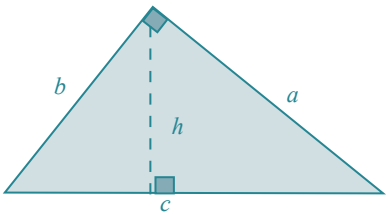
62. $\frac{d}{dx}\left(\text{sech}^{-1} u\right) = -\frac{1}{u\sqrt{1-u^2}}\frac{du}{dx}$

63. $\frac{d}{dx}\left(\text{csch}^{-1} u\right) = -\frac{1}{|u|\sqrt{u^2+1}}\frac{du}{dx}$

Formulario C: Álgebra, Geometría y Trigonometría

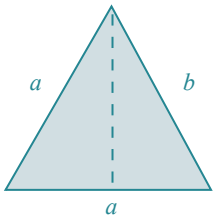
Figuras geométricas

Triángulo rectángulo



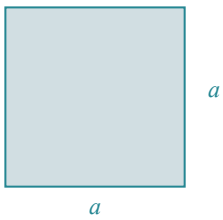
$A = \frac{1}{2}ch = \frac{1}{2}ab$, $P = a + b + c$, $c^2 = a^2 + b^2$

Triángulo equilátero



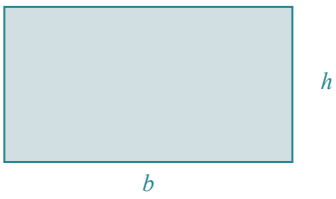
$h = \frac{\sqrt{3}}{2}a$, $A = \frac{\sqrt{3}}{4}a^2$, $P = 3a$

Cuadrado



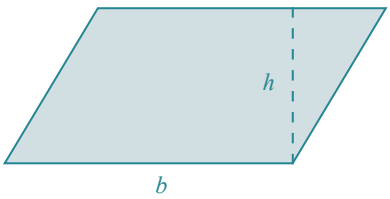
$A = a^2$, $P = 4a$

Rectángulo



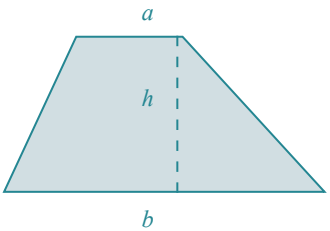
$P = 2b + 2h$, $A = bh$

Romboide



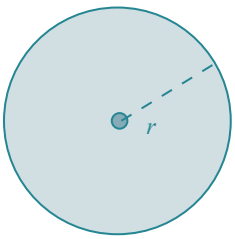
$A = bh$

Trapezoide



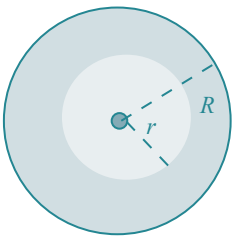
$A = \frac{1}{2}(a + b)h$

Círculo



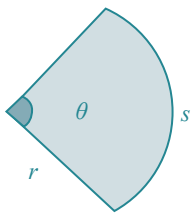
$A = \pi r^2$, $P = 2\pi r$

Corona circular



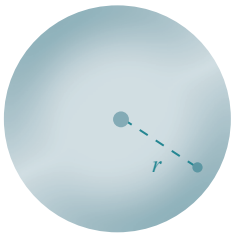
$A = \pi\left(R^2 - r^2\right)$, $P = 3a$

Sector circular



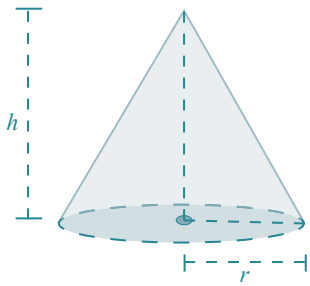
$A = \frac{1}{2}r^2\theta$, $s = r\theta$

Esfera



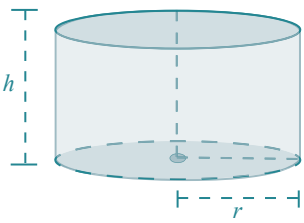
$V = \frac{4}{3}\pi r^3$, $S = 4\pi r^2$

Cono circular recto



$V = \frac{1}{3}\pi r^3$, $S = \pi r\sqrt{r^2 + h^2}$

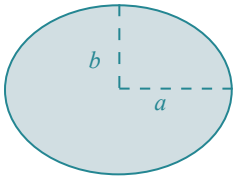
Cilindro circular recto



$V = \pi r^2 h$, $S = 2\pi rh$ lateral

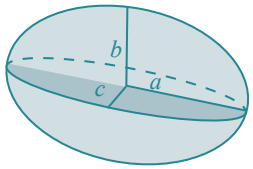
$S = 2\pi rh + 2\pi r^2$ total

Elipse



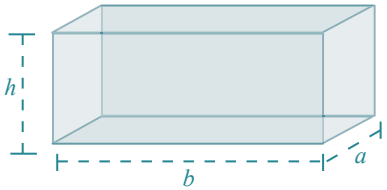
$A = \pi ab$

Elipsoide



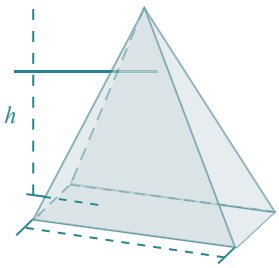
$A = \frac{4}{3}\pi abc$

Paralelepípedo rectangular



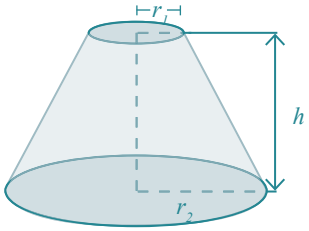
$V = abh,\ S = 2(ab + ah + bh)$

Pirámide



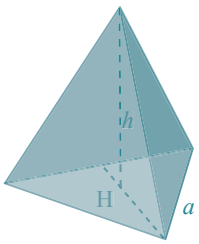
$V = \frac{1}{3}abh$

Cono truncado



$V = \frac{1}{3}\pi h(r_1^2 + 2r_1 r_2 + r_2^2)$

Pirámide Regular



$V = \frac{aH}{2}\left(\frac{1}{3}h\right)$

➟ Álgebra

Fórmula cuadrática

$ax^2 + bx + c = 0$

$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Discriminante $b^2 - 4ac$

Desarrollo de productos notables y factorización

$(x \pm y)^2 = x^2 \pm 2xy + y^2$

$(x \pm y)^3 = x^3 \pm 3(x)^2(y) + 3(x)(y)^2 \pm y^3$

$(x+y)^n = \binom{n}{0}x^n + \binom{n}{1}x^{n-1}y^1 + \binom{n}{2}x^{n-2}y^2 + \cdots + \binom{n}{n-1}x^1y^{n-1} + \binom{n}{n}y^n \quad \forall n = \mathbb{N}$

Donde $\binom{n}{k} = \frac{n!}{k!(n-k)!}$

$(x^2 - y^2) = (x+y)(x-y)$

$(x^3 \pm y^3) = (x \pm y)(x^2 \mp xy + y^2)$

Reglas de exponentes y radicales

$$x^m x^n = x^{m+n}$$
$$\left(x^m\right)^n = x^{m\cdot n}$$
$$\frac{x^m}{x^n} = x^{m-n}$$
$$x^{-m} = \frac{1}{x^m}$$
$$\left(\frac{x}{y}\right)^n = \frac{x^n}{y^n}$$
$$(xy)^n = x^n y^n$$
$$x^{\frac{1}{n}} = \sqrt[n]{x}$$
$$x^{\frac{n}{m}} = \sqrt[m]{x^n}$$
$$x^{\frac{n}{m}} = \left(\sqrt[m]{x}\right)^n$$
$$\sqrt[n]{(xy)} = \sqrt[n]{x}\sqrt[n]{y}$$
$$\sqrt[n]{\frac{x}{y}} = \frac{\sqrt[n]{x}}{\sqrt[n]{y}}$$
$$\sqrt[m]{\sqrt[n]{x}} = \sqrt[mn]{x}$$

Valores de exponenciales, propiedades de los logaritmos

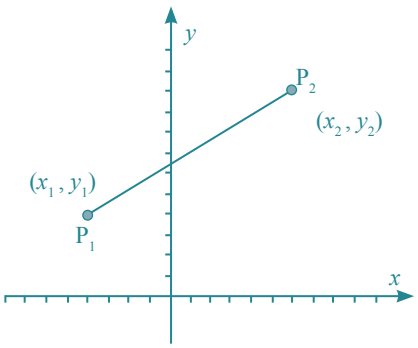
$$e^{-n} = \frac{1}{e^n}$$
$$e^0 = 1$$
$$e^{-\infty} \to 0$$
$$e^{\infty} \to \infty$$
$$e^{\ln(x)} = x$$
$$a^{\log_a x} = x$$
$$\log_a(x) = \frac{\log_{10}(x)}{\log_{10}(a)}$$
$$\ln(x) = \log_e x$$

$$\ln(x) + \ln(y) = \ln(xy)$$
$$\ln(x) - \ln(y) = \ln\left(\frac{x}{y}\right)$$
$$n\ln(x) = \ln\left(x^n\right)$$
$$\log_a(x) + \log_a(y) = \log_a(xy)$$
$$\log_a(x) - \log_a(y) = \log_a\left(\frac{x}{y}\right)$$
$$b\log_a(x) = \log_a\left(x^b\right)$$

➟ Geometría analítica

Distancia entre dos puntos

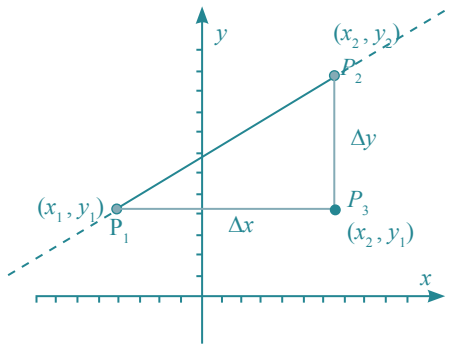
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$



Ecuación de la recta punto-pendiente

Pendiente de una recta

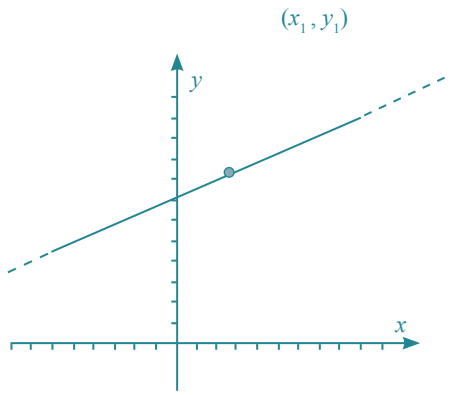
$$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$



Puntos de intersección de la recta

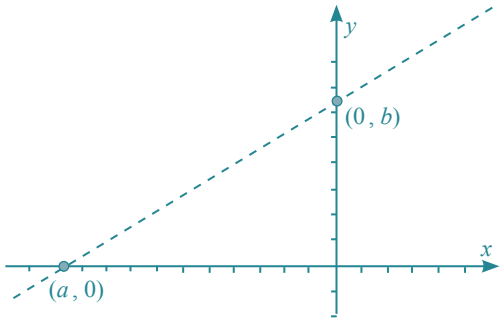
Ecuación de la recta punto-pendiente

$$y - y_1 = m(x - x_1)$$



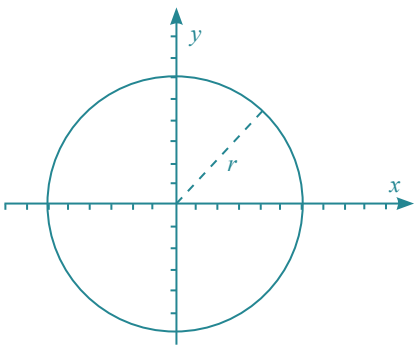
Puntos de intersección de la recta

$$\frac{x}{a} + \frac{y}{b} = 1 \qquad \forall a \neq 0; b \neq 0$$



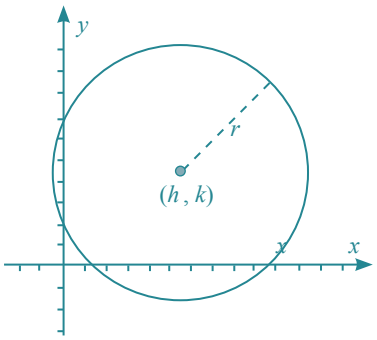
Ecuación de la circunferencia con centro en el origen

$$x^2 + y^2 = r^2$$



Ecuación de la circunferencia con centro fuera del origen.

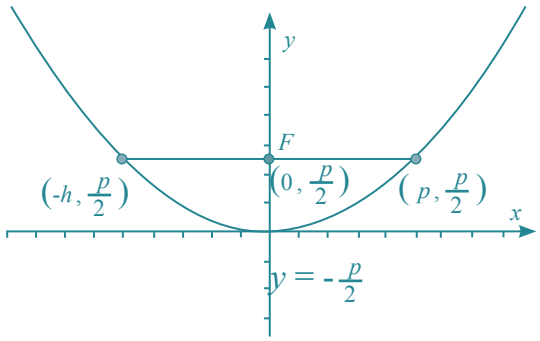
$$(x-h)^2 + (y-k)^2 = r^2$$



Parábola

$x^2 = 2py$; Foco $F=\left(0, \frac{p}{2}\right)$; Extremos $Izq\left(-p, \frac{p}{2}\right)$; $Der\left(p, \frac{p}{2}\right)$

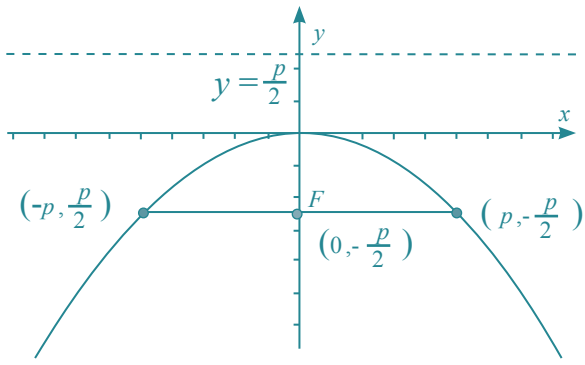
Lado Recto $Lr = 2p$; Recta Directriz $y = -\frac{p}{2}$



Parábola

$x^2 = -2py$; Foco $F=\left(0, -\frac{p}{2}\right)$; Extremos $Izq\left(-p, -\frac{p}{2}\right)$; $Der\left(p, -\frac{p}{2}\right)$

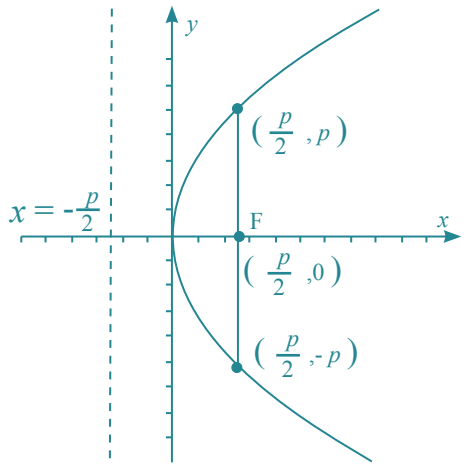
Lado Recto $Lr = 2p$; Recta Directriz $y = \frac{p}{2}$



Parábola

$y^2 = 2px$; Foco $F=\left(\frac{p}{2},0\right)$; Extremos $\text{Inf}\left(\frac{p}{2},-p\right)$; $\text{Sup}\left(\frac{p}{2},p\right)$

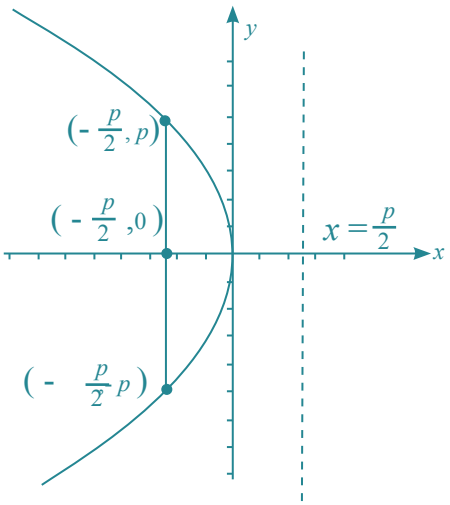
Lado Recto $Lr = 2p$; Recta Directriz $x = -\frac{p}{2}$



Parábola

$y^2 = -2px$; Foco $F=\left(-\frac{p}{2},0\right)$; Extremos $\text{Inf}\left(-\frac{p}{2},-p\right)$; $\text{Sup}\left(-\frac{p}{2},p\right)$

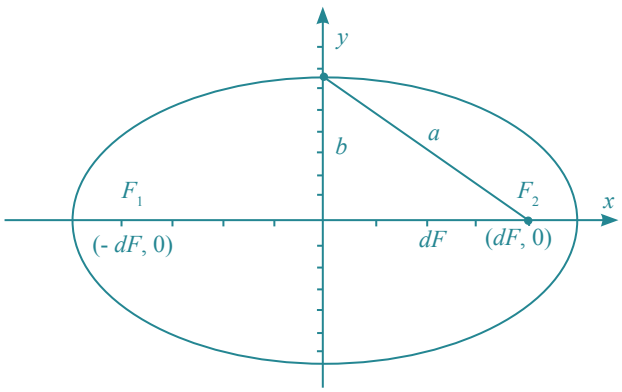
Lado Recto $Lr = 2p$; Recta Directriz $x = \frac{p}{2}$



Elipse centro en el origen

$\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ $\quad dF=\sqrt{a^2-b^2}$

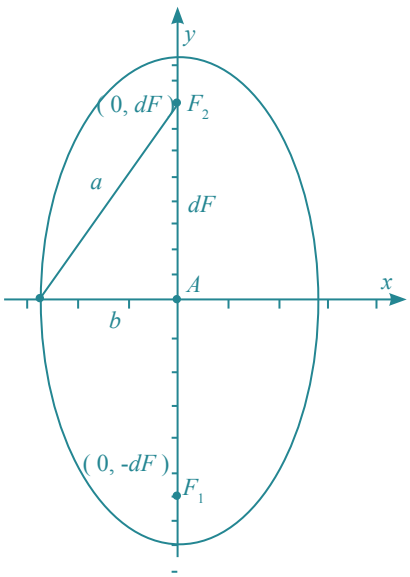
$F_1(-dF,0); F_2(dF,0)$



Elipse centro en el origen

$\frac{y^2}{a^2}+\frac{x^2}{b^2}=1$ $\quad dF=\sqrt{a^2-b^2}$

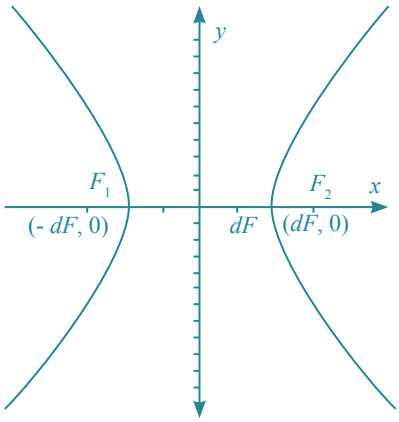
$F_1(0,-dF); F_2(0,dF)$



Hipérbola

$$\frac{x^2}{a^2}-\frac{y^2}{b^2}=1 \qquad dF=\sqrt{a^2+b^2}$$

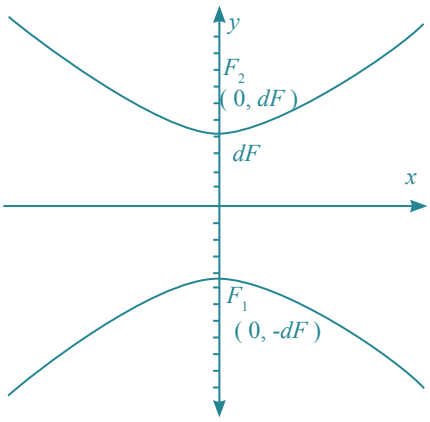
$$F_1(-dF,0);F_2(dF,0)$$



Hipérbola

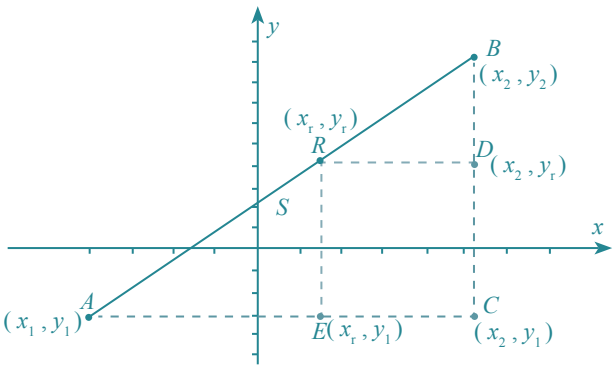
$$\frac{y^2}{a^2}-\frac{x^2}{b^2}=1 \qquad dF=\sqrt{a^2+b^2}$$

$$F_1(0,-dF);F_2(0,dF)$$



División de un segmento en una razón

$$r=\frac{x_2-x_1}{x_r-x_1} \qquad r=\frac{y_2-y_1}{y_r-y_1}$$



Distancia de un punto a una recta

Ecuación general de la recta $Ax+By+C=0$

$P(x_1,y_1)$ Entonces: $d_{Pr}=\left|\frac{Ax_1+Bx_2+C}{\sqrt{A^2+B^2}}\right|$