Cálculo II

Primavera 2021
Resolución de Integrales

1. Integrales inmediatas (completar la diferencial)

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

2. $\int \dfrac{x\,dx}{(a + bx^2)^3}$

3. $\int \dfrac{2x + 3}{\sqrt{x^2 + 3x}} dx$

4. $\int \dfrac{x^3}{\sqrt{a^4 + x^4}} dx$

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

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

7. $\int \dfrac{dx}{2 + 3x}$

8. $\int \dfrac{x^2}{2 + x^3} dx$

9. $\int \dfrac{x}{a + bx^2} dx$

10. $\int \dfrac{2x + 3}{x^2 + 3x} dx$

11. $\int \dfrac{x + 2}{2x^2 + 8x} dx$

12. $\int \dfrac{e^x}{a + be^x} dx$

13. $\int \dfrac{2x + 3}{x + 2} dx$

14. $\int \dfrac{x^2 + 2}{x + 1} dx$

15. $\int \dfrac{e^{2x}}{e^{2x} + 1} dx$

16. $\int \dfrac{e^x}{\sqrt{e^x - 5}} dx$

17. $\int 6e^{3x} dx$

18. $\int e^{\frac{x}{n}} dx$

19. $\int \dfrac{dx}{e^{\frac{x}{\pi}}}$

20. $\int 10^x dx$

21. $\int a^{nx} dx$

22. $\int (e^{\frac{x}{a}} + e^{\frac{-x}{a}}) dx$

23. $\int xe^{x^2} dx$

24. $\int \sqrt{e^x}\,dx$

25. $\int \dfrac{4}{\sqrt{e^x}} dx$

26. $\int \dfrac{e^{\sqrt{x}} - 3}{\sqrt{x}} dx$

27. $\int (e^{2x})^2 dx$

28. $\int \dfrac{e^x + 4}{e^x} dx$

29. $\int \dfrac{a}{2b^{3x}} dx$

30. $\int x(e^{x^2} + 2) dx$

31. $\int \dfrac{x}{(e^{x^2})^{\frac{1}{3}}} dx$

32. $\int (e^{5x} + e^{-5x})^2 dx$

33. $\int 6xe^{-x^2} dx$

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2. Integrales trigonométricas

1. $\int sen 4x\,dx$

2. $\int cos\frac{3}{4}x\,dx$

3. $\int tan\frac{\pi}{6}\,dx$

4. $\int -5\,cot 4x\,dx$

5. $\int \frac{2}{3}\,sec 6x\,dx$

6. $\int a\,csc bx\,dx$

7. $\int -\frac{b}{a}\,sen^2 ax\,dx$

8. $\int \frac{1}{b}\,cos^2 \frac{a}{b}x\,dx$

9. $\int \frac{3}{4}\,tan^2 \frac{\pi}{2}x\,dx$

10. $\int 3a\,sec^2 \frac{a\pi}{4}x\,dx$

11. $\int b\,cot^2 \pi^2 x\,dx$

12. $\int \frac{1}{5}\,csc^2 10x\,dx$

13. $\int \frac{1}{3}\,cos^3 \frac{2}{3}x\,dx$

14. $\int \frac{1}{2}\,sec^4 4x\,dx$

15. $\int tan^4 \pi x\,dx$

16. $\int cot^6 2x\,dx$

17. $\int sen^5 \pi x\,dx$

18. $\int \frac{dx}{1+sen x}$

19. $\int \frac{dx}{sen^2 x}$

20. $\int (sec x - tan x)^2\,dx$

21. $\int \frac{dx}{1+cos x}$

22. $\int \frac{dx}{cos^2 x}$

23. $\int (tan x + cot x)^2\,dx$

24. $\int cot^5 x\,dx$

25. $\int sec^6 2x\,dx$

26. $\int sen^3 2x\,cos^3 2x\,dx$

27. $\int csc^6 3x\,dx$

28. $\int sen^4 3x\,cos^3 3x\,dx$

29. $\int \left(\frac{tan 4x}{cos 4x}\right)^4\,dx$

30. $\int \left(\frac{csc 3x}{tan 3x}\right)^2\,dx$

31. $\int \frac{sec^4 x}{\sqrt{tan x}}\,dx$

32. $\int \frac{sec^4 x}{tan^3 x}\,dx$

33. $\int tan^4 2x\,sec^4 2x\,dx$

34. $\int \frac{tan^3 3x}{sec^3 3x}\,dx$

35. $\int sen(-2x)\,cos(-4x)\,dx$

36. $\int sen(3x)\,sen(-5x)\,dx$

37. $\int -cos(-4x)\,cos(-3x)\,dx$

38. $\int sen(8x)\,cos(-3x)\,dx$

39. $\int sen(-5x)\,sen(-9x)\,dx$

40. $\int sen(-2x)\,(-cos(-4x))\,dx$

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3. Sustitución trigonométrica

1. $\int \dfrac{dx}{x^2+9}$

2. $\int \dfrac{dx}{x^2-4}$

3. $\int \dfrac{dx}{\sqrt{25-x^2}}$

4. $\int \dfrac{dx}{9x^2-4}$

5. $\int \dfrac{dx}{\sqrt{16-9x^2}}$

6. $\int \dfrac{dx}{9x^2-1}$

7. $\int \dfrac{dx}{x^2+2x-3}$

8. $\int \dfrac{dx}{\sqrt{x^2+2x+5}}$

9. $\int \dfrac{dx}{\sqrt{x^2+2x}}$

10. $\int \dfrac{dx}{\sqrt{x^2+4x+3}}$

11. $\int \dfrac{dx}{\sqrt{4x^2-12x+7}}$

12. $\int \dfrac{dx}{\sqrt{9x^2+12x+8}}$

4. Integración por partes

1. $\int x\sec^2 x\,dx$

2. $\int 2x a^x\,dx$

3. $\int x^2 \,sen\, mx\,dx$

4. $\int arcsec\, x\,dx$

5. $\int \dfrac{lnx}{(x+1)^2}\,dx$

6. $\int x\, arctanx\,dx$

7. $\int e^x cos2x\,dx$

8. $\int x^3 e^{-x} x\,dx$

9. $\int \sqrt{x}\, lnx\,dx$

10. $\int senx\, ln(cosx)\,dx$

11. $\int x(2x+3)^{24}\,dx$

12. $\int e^{4x} sen5x\,dx$

13. $\int (lnx)^2\,dx$

14. $\int csc^5 x\,dx$

15. $\int sec^3 4x\,dx$

16. $\int cos\sqrt{x}\,dx$

17. $\int arccos\, x\,dx$

18. $\int x\sqrt{x+3}\,dx$

19. $\int x^4 e^x\,dx$

20. $\int \dfrac{xe^x}{(x+1)^2}\,dx$

5. Integración por fracciones parciales

1. $\int \dfrac{dx}{x^2+8x+12}$

2. $\int \dfrac{5x^3+2}{x^3-5x^2+4x}\,dx$

3. $\int \dfrac{dx}{(x-1)(x+2)(x-3)}$

4. $\int \dfrac{x^2-5x+9}{x^2-5x+6}\,dx$

5. $\int \dfrac{5x^2+6x+9}{(x-3)^2(x+1)^2}\,dx$

6. $\int \dfrac{2x-3}{(x^2-3x+2)^3}\,dx$

7. $\int \dfrac{dx}{x^4+x^2}$

8. $\int \dfrac{x^5+9x^3-9x^2-9}{x^3+9x}\,dx$

9. $\int \dfrac{x-18}{4x^3+9x}\,dx$

10. $\displaystyle\int \frac{2x}{(x^2+1)(x+1)^2}\,dx$ 12. $\displaystyle\int \frac{x^5+4x^3}{(x^2+2)^3}\,dx$ 14. $\displaystyle\int \frac{4x^2+2x+8}{x(x^2+2)^2}\,dx$

11. $\displaystyle\int \frac{x^5}{(x^2+4)^2}\,dx$ 13. $\displaystyle\int \frac{x^3+2x^2+6x+8}{(x^2+4)^2}\,dx$

6. Cambio de variable algebraico $x=z^{mcm}$

  1. $\displaystyle\int x\sqrt[3]{a+x}\,dx$ 3. $\displaystyle\int \frac{1}{1+\sqrt[3]{x+b}}\,dx$ 5. $\displaystyle\int \frac{x}{(a+bx)^{\frac{3}{2}}}\,dx$

  2. $\displaystyle\int \frac{\sqrt{x+1}+1}{\sqrt{x+1}-1}\,dx$ 4. $\displaystyle\int \frac{x+5}{(x+4)\sqrt{x+2}}\,dx$ 6. $\displaystyle\int \frac{dx}{x^{\frac{5}{8}}-x^{\frac{1}{8}}}$

7. Diferenciales binómicas

  1. $\displaystyle\int \frac{x^3}{(a+bx^2)^{\frac{3}{2}}}\,dx$ 4. $\displaystyle\int \frac{x^5}{(a+bx^3)^{\frac{3}{2}}}\,dx$ 7. $\displaystyle\int \frac{dx}{x^3(1+x^3)^{\frac{4}{3}}}$

  2. $\displaystyle\int x^5\sqrt{1+x^3}\,dx$ 5. $\displaystyle\int x(1+x^3)^{\frac{1}{3}}\,dx$ 8. $\displaystyle\int \frac{dx}{x^2(1+x^3)^{\frac{2}{3}}}$

  3. $\displaystyle\int x^5(8+x^3)^{\frac{3}{2}}\,dx$ 6. $\displaystyle\int \frac{2\sqrt{1+x^4}}{x^3}\,dx$ 9. $\displaystyle\int \frac{dx}{x^3(1+x^3)^{\frac{1}{3}}}$

8. Transformación de diferenciales trigonométricas con $tan\frac{1}{2}x=z$

  1. $\displaystyle\int \frac{dx}{senx+cosx}$ 3. $\displaystyle\int \frac{senx}{1-senx}\,dx$ 5. $\displaystyle\int \frac{dx}{cosx+2senx+3}$

  2. $\displaystyle\int \frac{cosx}{1+cosx}\,dx$ 4. $\displaystyle\int \frac{dx}{8-4senx+7cosx}$ 6. $\displaystyle\int \frac{1+tanx}{1-tanx}\,dx$

9. Sustituciones diversas

  1. $\displaystyle\int 2x^3\sqrt{x^2+5}\,dx$ 3. $\displaystyle\int \frac{x^2+1}{\sqrt{x+2}}\,dx$ 5. $\displaystyle\int \frac{dx}{x\sqrt{1+x+x^2}}$

  2. $\displaystyle\int \frac{x}{\sqrt{3x+1}}\,dx$ 4. $\displaystyle\int \frac{\sqrt{9-x^2}}{x^4}\,dx$ 6. $\displaystyle\int \frac{dx}{e^x+e^{-x}}$

10. Miscelánea de ejercicios

1. $\int \dfrac{1}{x^2 + 2x + 3}\, dx$

2. $\int \dfrac{2x + 1}{\sqrt{4x - 3 - x^2}}\, dx$

3. $\int \dfrac{x}{1 + x^4}\, dx$

4. $\int cos^3 x\, sen x\, dx$

5. $\int \dfrac{e^{\sqrt{x}}}{3e^{\sqrt{x}}}\, dx$

6. $\int \dfrac{1}{x + \sqrt{x}}\, dx$

7. $\int e^{x + e^x}\, dx$

8. $\int \dfrac{1 + ln x}{(x\, ln x)^2}\, dx$

9. $\int \dfrac{x^3 + 3x}{x^2 + 1}\, dx$

10. $\int \dfrac{1}{e^{2x} - 3e^x}\, dx$

11. $\int \dfrac{dx}{\sqrt{27x^2 + 6x - 1}}$

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

13. $\int \dfrac{sec^4 x}{\sqrt{tan x}}\, dx$

14. $\int csc^5 ax\, dx$

15. $\int \dfrac{6x\, sen\sqrt{2x^2 - 3}}{\sqrt{2x^2 - 3}}\, dx$

16. $\int \sqrt{4x^2 + 9}\, dx$