

1. p38e01 - Calcula las siguientes integrales inmediatas:

(a) $\int 4x^6 \cdot dx$

Sol: $\frac{4x^7}{7} + K$

Sol: $\frac{\operatorname{atan}\left(\frac{x}{2}\right)}{2} + K$

(b) $\int 6x^3 + 8x^2 + 3 \cdot dx$

Sol: $\frac{3x^4}{2} + \frac{8x^3}{3} + 3x + K$

(k) $\int \frac{2x-3}{x^2-3x+9} \cdot dx$

Sol: $\log(x^2 - 3x + 9) + K$

(c) $\int \sqrt{2}\sqrt{x} \cdot dx$

Sol: $\frac{2\sqrt{2}x^{\frac{3}{2}}}{3} + K$

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

Sol: $e^{x^2} + K$

(d) $\int \frac{1}{\sqrt[5]{x}} \cdot dx$

Sol: $\frac{5x^{\frac{4}{5}}}{4} + K$

(m) $\int \frac{1}{x-4} \cdot dx$

Sol: $\log(x - 4) + K$

(e) $\int \frac{\sqrt[3]{5}\sqrt[3]{x^2} + \sqrt{3}\sqrt{x^3}}{\sqrt{2}\sqrt{x}} \cdot dx$

Sol: $\frac{\sqrt{2}\left(6\frac{\sqrt[3]{5}\sqrt{x}\sqrt[3]{x^2}}{7} + \frac{\sqrt{3}\sqrt{x}\sqrt{x^3}}{2}\right)}{2} + K$

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

Sol: $-\frac{1}{2x^2-16x+32} + K$

(f) $\int \frac{1}{x-1} \cdot dx$

Sol: $\log(x - 1) + K$

(ñ) $\int e^{5x} \cdot dx$

Sol: $\frac{e^{5x}}{5} + K$

(g) $\int \frac{5}{4x^2+1} \cdot dx$

Sol: $\frac{5\operatorname{atan}(2x)}{2} + K$

(o) $\int \frac{\sqrt{x}+x}{x^2} \cdot dx$

Sol: $\log(x) - \frac{2}{\sqrt{x}} + K$

(h) $\int \frac{2}{9x^2+1} \cdot dx$

Sol: $\frac{2\operatorname{atan}(3x)}{3} + K$

(p) $\int \frac{\log(x)^3}{x} \cdot dx$

Sol: $\frac{\log(x)^4}{4} + K$

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

Sol: $-\frac{\log\left(x-\frac{1}{2}\right)}{4} + \frac{\log\left(x+\frac{1}{2}\right)}{4} + K$

(q) $\int \frac{\sin(\sqrt{x})}{\sqrt{x}} \cdot dx$

Sol: $-2\cos(\sqrt{x}) + K$

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

(r) $\int e^{9+(-2)x} \cdot dx$

Sol: $-\frac{e^{9-2x}}{2} + K$

2. p38e01cont - Calcula las siguientes integrales inmediatas:

(a) $\int 3^x - x^3 \cdot dx$

Sol: $\frac{3^x}{\log(3)} - \frac{x^4}{4} + K$

(f) $\int e^{4x-3} \cdot dx$

Sol: $\frac{e^{4x-3}}{4} + K$

(b) $\int \frac{3x^2+2e^{2x}+\cos(x)}{x^3+e^{2x}+\sin(x)} \cdot dx$

Sol: $\log(x^3 + e^{2x} + \sin(x)) + K$

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

Sol: $\frac{4\sqrt{3} \operatorname{atan}\left(\frac{\sqrt{3}x}{3}\right)}{3} + K$

(c) $\int 6 \cos(2x-1) \cdot dx$

Sol: $3 \sin(2x-1) + K$

(h) $\int \sqrt{(x+3)^3} \cdot dx$

Sol: $\int \sqrt{(x+3)^3} dx + K$

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

Sol: $\frac{\log(x^2+2x+3)}{2} + K$

(i) $\int \frac{\sin(x)}{\cos(x)} \cdot dx$

Sol: $\frac{\sin^2(x)}{2} + K$

Sol: $-\log(\cos(x)) + K$

3. p38e02 - Calcula las siguientes integrales, por cambio de variable:

(a) $\int x \sin(x^2) \cdot dx$

Sol: $-\frac{\cos(x^2)}{2} + K$

Sol: $2\sqrt{\tan(x)} + K$

(b) $\int \frac{x}{\sqrt{x^2+5}} \cdot dx$

Sol: $\sqrt{x^2+5} + K$

(f) $\int (x-1)\sqrt{x^2-2x} \cdot dx$

Sol: $\frac{x^2\sqrt{x^2-2x}}{3} - \frac{2x\sqrt{x^2-2x}}{3} + K$

(c) $\int \frac{\sin(x)}{\cos^5(x)} \cdot dx$

Sol: $\frac{1}{4\cos^4(x)} + K$

(g) $\int \sin(x) \sin(\cos(x)) \cdot dx$

Sol: $\cos(\cos(x)) + K$

(d) $\int \frac{x}{(x^2+3)^5} \cdot dx$

Sol: $-\frac{1}{8x^8+96x^6+432x^4+864x^2+648} + K$

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

Sol: $\frac{\log(x)^3}{3} + \log(x) + K$

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

(i) $\int \sqrt{(\cos(x)+1)^3} \sin(x) \cdot dx$

Sol: $\int \sqrt{(\cos(x)+1)^3} \sin(x) dx + K$

4. p38e03 - Calcula las siguientes integrales, por partes:

(a) $\int e^x x \cdot dx$

Sol: $(x - 1) e^x + K$

(f) $\int \operatorname{asin}(x) \cdot dx$

Sol: $x \operatorname{asin}(x) + \sqrt{1 - x^2} + K$

(b) $\int \log(x) \cdot dx$

Sol: $x \log(x) - x + K$

(g) $\int x \cos(3x) \cdot dx$

Sol: $\frac{x \sin(3x)}{3} + \frac{\cos(3x)}{9} + K$

(c) $\int x^3 \log(x) \cdot dx$

Sol: $\frac{x^4 \log(x)}{4} - \frac{x^4}{16} + K$

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

Sol: $\frac{(2x^2 - 2x + 1)e^{2x}}{4} + K$

(d) $\int x \sin(x) \cdot dx$

Sol: $-x \cos(x) + \sin(x) + K$

(i) $\int \frac{x}{e^x} \cdot dx$

Sol: $(-x - 1) e^{-x} + K$

(e) $\int \operatorname{atan}(x) \cdot dx$

Sol: $x \operatorname{atan}(x) - \frac{\log(x^2 + 1)}{2} + K$

(j) $\int \frac{\log(x)}{x^2} \cdot dx$

Sol: $-\frac{\log(x)}{x} - \frac{1}{x} + K$

5. p38e04 - Resuelve las siguientes integrales, que luego aparecerán al integrar funciones racionales:

(a) $\int \frac{3}{2x-1} \cdot dx$

Sol: $\frac{3 \log(2x-1)}{2} + K$

Sol: $\frac{\log(3x-4)}{3} + K$

(b) $\int \frac{2}{(x+2)^3} \cdot dx$

Sol: $-\frac{1}{x^2 + 4x + 4} + K$

(f) $\int \frac{7}{(2x-3)^2} \cdot dx$

Sol: $-\frac{7}{4x-6} + K$

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

Sol: $\frac{7 \log(x^2+4)}{2} - \frac{5 \operatorname{atan}(\frac{x}{2})}{2} + K$

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

Sol: $\frac{3 \log(x^2+2)}{2} + 2\sqrt{2} \operatorname{atan}\left(\frac{\sqrt{2}x}{2}\right) + K$

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

Sol: $\frac{\log(x^2+x+1)}{2} + \sqrt{3} \operatorname{atan}\left(\frac{\sqrt{3}(2x+1)}{3}\right) + K$

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

Sol: $\frac{\log(x^2+2x+3)}{2} - \sqrt{2} \operatorname{atan}\left(\frac{\sqrt{2}(x+1)}{2}\right) + K$

(e) $\int \frac{1}{3x-4} \cdot dx$

6. p38e05 - Calcula las siguientes integrales racionales:

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

Sol: $-2 \log(x) + 3 \log(x+1) + K$

(b) $\int \frac{x^3+4x^2-10x+7}{x^3-7x-6} \cdot dx$

Sol: $x + 2 \log(x-3) - 5 \log(x+1) + 7 \log(x+2) + K$

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

Sol: $\frac{\log(x)}{2} + 2 \log(x-1) - \frac{\log(x+2)}{2} + K$

(d) $\int \frac{2x+3}{x^2+3x-10} \cdot dx$

Sol: $\log(x^2+3x-10) + K$

(e) $\int \frac{1}{x^3+x^2-6x} \cdot dx$

Sol: $-\frac{\log(x)}{6} + \frac{\log(x-2)}{10} + \frac{\log(x+3)}{15} + K$

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

Sol: $x + \frac{3 \log(x-1)}{2} + \frac{\log(x+1)}{2} + K$

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

Sol: $\frac{2(x+1) \log(x-1)-3}{x+1} + K$

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

Sol: $\frac{5(x-1)(\log(x-1)-\log(x+3))+4}{8(x-1)} + K$

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

Sol: $\frac{-12x+5(\log(x-1)-\log(x+2))(x^2+x-2)-6}{27(x^2+x-2)} + K$

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

Sol: $\frac{2(x-1)(\log(x)-\log(x-1))-3}{x-1} + K$

(k) $\int \frac{8x^2-2x-1}{x^3-x^2+4x-4} \cdot dx$

Sol: $\log(x-1) + \frac{7 \log(x^2+4)}{2} + \frac{5 \operatorname{atan}\left(\frac{x}{2}\right)}{2} + K$

(l) $\int \frac{6x+8}{x^2+2x+5} \cdot dx$

Sol: $3 \log(x^2+2x+5) + \operatorname{atan}\left(\frac{x}{2} + \frac{1}{2}\right) + K$

(m) $\int \frac{3x-2}{x^3-3x^2+12x-10} \cdot dx$

Sol: $\frac{\log(x-1)}{9} - \frac{\log(x^2-2x+10)}{18} + \operatorname{atan}\left(\frac{x}{3} - \frac{1}{3}\right) + K$

7. p38e06 - Calcula las siguientes integrales trigonométricas:

(a) $\int \cos^3(x) dx$

Sol: $-\frac{\sin^3(x)}{3} + \sin(x) + K$

(b) $\int \sin^3(x) dx$

Sol: $\frac{\cos^3(x)}{3} - \cos(x) + K$

(c) $\int \sin^3(x) \cos(x) dx$

Sol: $\frac{\sin^4(x)}{4} + K$

(d) $\int \sin(x) \cos^4(x) dx$

Sol: $-\frac{\cos^5(x)}{5} + K$

(e) $\int \cos^2(x) dx$

$$\text{Sol: } \frac{x}{2} + \frac{\sin(2x)}{4} + K$$

$$(f) \int \sin^2(x) dx$$

$$\text{Sol: } \frac{x}{2} - \frac{\sin(2x)}{4} + K$$

$$(g) \int \sin^2(x) \cos^2(x) dx$$

$$\text{Sol: } \frac{x}{8} - \frac{\sin(4x)}{32} + K$$

$$(h) \int \cos^4(x) dx$$

$$\text{Sol: } \frac{3x}{8} + \frac{\sin(2x)}{4} + \frac{\sin(4x)}{32} + K$$

$$(i) \int \frac{\sin(x) + \tan(x)}{\cos(x)} dx$$

$$\text{Sol: } -\log(\cos(x)) + \frac{1}{\cos(x)} + K$$

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

$$\text{Sol: } \frac{\log(\cos^2(x)+1)}{2} - \log(\cos(x)) + K$$

$$(k) \int \frac{\sin(x)\cos(x)}{1-\cos(x)} dx$$

$$\text{Sol: } \log(\cos(x)-1) + \cos(x) + K$$

$$(l) \int \frac{\sin^3(x)}{1-\cos(x)} dx$$

$$\text{Sol: } -\frac{\cos^2(x)}{2} - \cos(x) + \frac{3}{2} + K$$

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

$$\text{Sol: } \frac{2\sqrt{3}\left(\operatorname{atan}\left(\frac{\sqrt{3}\tan\left(\frac{x}{2}\right)}{3}\right) + \pi\left\lfloor\frac{x}{2\pi} - \frac{1}{2}\right\rfloor\right)}{3} + K$$

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

$$\text{Sol: } \frac{2\sqrt{3}\left(\operatorname{atan}\left(\frac{\sqrt{3}\tan\left(\frac{x}{2}\right)}{3}\right) + \pi\left\lfloor\frac{x}{2\pi} - \frac{1}{2}\right\rfloor\right)}{3} + K$$

$$(\tilde{n}) \int \frac{1}{\sin(x)+\cos(x)+1} dx$$

$$\text{Sol: } \log\left(\tan\left(\frac{x}{2}\right) + 1\right) + K$$

$$(o) \int \frac{\cos^2(x)}{\sin^2(x)} dx$$

$$\text{Sol: } -x - \frac{1}{\tan(x)} + K$$

8. p38e07 - Calcula las siguientes integrales irracionales:

$$(a) \int \frac{\sqrt{x}}{\sqrt[4]{x}+\sqrt{x}} dx$$

$$\text{Sol: } -\frac{4x^{\frac{3}{4}}}{3} - 4\sqrt[4]{x} + 2\sqrt{x} + x + 4\log(\sqrt[4]{x}+1) + K$$

$$(b) \int \frac{\sqrt[4]{x}+\sqrt{x}}{-\sqrt[4]{x}+\sqrt{x}} dx$$

$$\text{Sol: } \frac{8x^{\frac{3}{4}}}{3} + 8\sqrt[4]{x} + 4\sqrt{x} + x + 8\log(\sqrt[4]{x}-1) + K$$

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

$$\text{Sol: } 2\sqrt{x} - 2\operatorname{atan}(\sqrt{x}) + K$$

$$(d) \int \frac{x}{\sqrt{x}+x} dx$$

$$\text{Sol: } -2\sqrt{x} + x + 2\log(\sqrt{x}+1) + K$$

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

$$\text{Sol: } 4\sqrt[4]{x} + 2\sqrt{x} + 4\log(\sqrt[4]{x}-1) + K$$

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

$$\mathbf{Sol:} \quad \begin{cases} -\operatorname{acosh}\left(\frac{1}{x}\right) & \text{for } \left|\frac{1}{x^2}\right| > 1 \\ i \operatorname{asin}\left(\frac{1}{x}\right) & \text{otherwise} \end{cases} + K$$

$$(g) \quad \int \sqrt{x^2 + 1} \, dx$$

$$\mathbf{Sol:} \quad \frac{x\sqrt{x^2+1}}{2} + \frac{\operatorname{asinh}(x)}{2} + K$$