

1. Calcula: $\int_1^3 |x| dx$ (Soluc: 4)

2. Calcula: $\int_0^1 x \sqrt{a^2 + b^2 x^2} dx$ (Soluc: $\frac{\sqrt{(a^2 + b^2)^3} - a^3}{3b^2}$)

3. Calcula: $\int_0^2 |2x - 1| dx$ (Soluc: 5/2)

4. Calcula: $\int_0^{\sqrt{\pi/2}} x \sin x^2 dx$ (Soluc: 1/2)

5. Calcula: $\int_0^1 x \arctan x dx$ (Soluc: $\pi/4 - 1/2$)

6. Calcula: $\int_0^1 (x^2 + 1)e^{-2x} dx$ (Soluc: $\frac{3}{4} - \frac{7}{4e^2}$)

7. Calcula: $\int_0^1 \frac{dx}{(x+1)(x+2)}$ (Soluc: $\ln \frac{3}{4}$)

8. Calcula: $\int_0^1 \frac{dx}{4x^2 - 9}$ (Soluc: $\frac{-1}{6} \ln 5$)

9. Sean $a = \int_0^{\pi/2} x \sin^2 x dx$ e $b = \int_0^{\pi/2} x \cos^2 x dx$. Calcula $a + b$ e $a - b$ e obtén los valores de a e b . (Soluc: $a = (\pi^2 - 4)/16$; $b = (\pi^2 - 4)/16$)

1.
 - PISTA 1: Inmediata
 - PISTA 2: $F(x) = \frac{x^2}{2}$

2.
 - PISTA 1: Cuasiinmediata ou cambio de variable
 - PISTA 2: $t = a^2 + b^2x^2$
 - PISTA 3: $F(x) = \frac{\sqrt{(a^2 + b^2x^2)^3}}{3b^2}$

3.
 - PISTA 1: $2x - 1 \geq 0 \implies x \geq 1/2$
 - PISTA 2:
$$\begin{cases} -(2x - 1) & \text{se } x < 1/2 \\ 2x - 1 & \text{se } x \geq 1/2 \end{cases}$$
 - PISTA 3: $\int_0^{1/2} (-2x + 1)dx + \int_{1/2}^2 (2x - 1)dx$

4.
 - PISTA 1: Cuasiinmediata ou cambio de variable
 - PISTA 2: $t = x^2$
 - PISTA 3: $F(x) = \frac{-\cos x^2}{2}$

5.
 - PISTA 1: Por partes
 - PISTA 2:
$$\begin{cases} u = \arctan x \implies du = \frac{1}{1+x^2}dx \\ dv = xdx \implies v = \frac{x^2}{2} \end{cases}$$
 - PISTA 3: División de $\frac{x^2}{x^2 + 1}$
 - PISTA 4: $F(x) = \frac{x^2}{2} \arctan x - \frac{1}{2}(x - \arctan x)$

6.
 - PISTA 1: Por partes
 - PISTA 2:
$$\begin{cases} u = x^2 + 1 \implies du = 2xdx \\ dv = e^{-2x}dx \implies v = \frac{e^{-2x}}{-2} \end{cases}$$
 - PISTA 3: Por partes de novo

- PISTA 4:
$$\begin{cases} u = x & \implies du = dx \\ dv = -e^{-2x} dx & \implies v = \frac{e^{-2x}}{2} \end{cases}$$
- PISTA 5:
$$F(x) = -(x^2 + 1) \frac{e^{-2x}}{2} - x \frac{e^{-2x}}{2} - \frac{e^{-2x}}{4}$$