

1. DETERMINA LAS SIGUIENTES INTEGRALES DEFINIDAS:

A.

$$\int_4^7 x^2 dx = \left[\frac{x^3}{3} \right]_4^7 = \frac{7^3}{3} - \frac{4^3}{3} = \frac{343}{3} - \frac{64}{3} = \frac{279}{3} = 93$$

B.

$$\begin{aligned} \int_{-2}^{-1} \frac{dx}{(x-1)^3} &= \int_{-2}^{-1} (x-1)^{-3} dx = \left[\frac{(x-1)^{-2}}{-2} \right]_{-2}^{-1} = -\frac{1}{2(x-1)^2} \Big|_{-2}^{-1} \\ &= \left(-\frac{1}{2(-1-1)^2} \right) - \left(-\frac{1}{2(-2-1)^2} \right) = -\frac{1}{2(-2)^2} + \frac{1}{2(-3)^2} \\ &= -\frac{1}{2(4)} + \frac{1}{2(9)} = -\frac{1}{8} + \frac{1}{18} = -\frac{5}{72} \end{aligned}$$

C. Para el siguiente ejercicio ten en cuenta la identidad trigonométrica $\sin^2 x = \frac{1-\cos 2x}{2}$ y la integral

$$\int \frac{\cos 2x}{2} dx = \frac{\sin 2x}{4}$$

$$\begin{aligned} \int_0^\pi \sin^2 x dx &= \int_0^\pi \frac{1-\cos 2x}{2} dx = \int_0^\pi \frac{1}{2} dx - \int_0^\pi \frac{\cos 2x}{2} dx = \left[\frac{x}{2} \right]_0^\pi - \left[\frac{\sin 2x}{4} \right]_0^\pi \\ &= \frac{\pi}{2} - \frac{\sin 2\pi}{4} + \frac{\sin 0}{4} = \frac{\pi}{2} - \frac{0}{4} + \frac{0}{4} = \frac{\pi}{2} \end{aligned}$$

2. DETERMINE LAS SIGUIENTES INTEGRALES INDEFINIDAS.

$$\begin{aligned} A. \int \frac{1}{x^2 \sqrt[5]{x^2}} dx &= \int x^{-2} x^{-\frac{2}{5}} dx = \int x^{-\frac{12}{5}} dx = \frac{x^{-\frac{12}{5}+1}}{-\frac{12}{5}+1} + C = -\frac{5}{\sqrt[5]{x^7}} + C \\ &= -\frac{5}{\sqrt[5]{x^7}} + C \end{aligned}$$

$$\begin{aligned} B. \int (x + \sqrt{x}) dx &= \int x dx + \int x^{\frac{1}{2}} dx = \frac{x^2}{2} + \frac{2}{\frac{1}{2}+1} x^{\frac{1}{2}+1} + C = \frac{x^2}{2} + \frac{2}{\frac{3}{2}} x^{\frac{3}{2}} + C \\ &= \frac{x^2}{2} + \frac{2 \sqrt{x^3}}{\frac{3}{2}} + C = \frac{x^2}{2} + \frac{2 \sqrt{x^3}}{\frac{3}{2}} + C \end{aligned}$$