

Calcolare il seguente integrale definito

$$(a) \int_0^4 \frac{\sqrt{x}}{2}(x+2)dx = ?$$

**SOLUZIONE**

Ricordando la relazione per il calcolo degli integrali definiti

$$\int_a^b f(x) \cdot dx = [F(x)]_a^b = F(b) - F(a)$$

$$\begin{aligned} \int_0^4 \frac{\sqrt{x}}{2}(x+2)dx &= \frac{1}{2} \int_0^4 x^{\frac{1}{2}}(x+2)dx = \\ &= \frac{1}{2} \int_0^4 \left(x^{\frac{3}{2}} + 2x^{\frac{1}{2}}\right)dx = \\ &= \left[ \frac{1}{2} \left( \frac{2}{5} x^{\frac{5}{2}} + \frac{4}{3} x^{\frac{3}{2}} \right) \right]_0^4 = \\ &= \left[ \left( \frac{1}{5} x^{\frac{5}{2}} + \frac{2}{3} x^{\frac{3}{2}} \right) \right]_0^4 = \\ &= \left[ \frac{1}{15} x^{\frac{3}{2}}(3x+10) \right]_0^4 = \\ &= \frac{8}{15}(22) \end{aligned}$$