

$$\int x\sqrt{x-1} \, dx =$$

INT-S1-030

$$= \text{SOSTITUZIONE: } \begin{aligned} x-1 &= z \\ x &= z+1 \\ x' &= \frac{dx}{dz} = 1 \\ dx &= dz \end{aligned}$$

$$= \int (z+1)\sqrt{z} \, dz =$$

$$= \int z\sqrt{z} \, dz + \int \sqrt{z} \, dz =$$

$$= \int z^{1+\frac{1}{2}} \, dz + \int z^{\frac{1}{2}} \, dz =$$

$$= \frac{1}{\frac{3}{2}+1} z^{\frac{3}{2}+1} + \frac{1}{\frac{1}{2}+1} z^{\frac{1}{2}+1} + k =$$

$$= \frac{2}{5} z^{\frac{5}{2}} + \frac{2}{3} z^{\frac{3}{2}} + k =$$

$$= \boxed{\frac{2}{5} (x-1)^{\frac{5}{2}} + \frac{2}{3} (x-1)^{\frac{3}{2}} + k}$$