12.15

tisdag 20 december 2022 14:47

a)
$$\int x(1+x^2)^5 = \left[\begin{array}{l} t = 1+x^2 \\ \frac{dt}{dx} = 2x \quad \frac{dt}{2} = x\,dx \end{array}\right] = \int \frac{t^5}{2} \cdot dt = \frac{t^6}{12} + C = \underline{\underline{\frac{(1+x^2)^6}{12} + C}}$$

b)
$$\int \frac{1}{\sqrt{x}} \sin\sqrt{x}\, dx = \left[\begin{array}{l} t = \sqrt{x} \\ \frac{dt}{dx} = \frac{1}{2}\cdot\frac{1}{\sqrt{x}} \quad 2dt = \frac{1}{\sqrt{x}}\,dx \end{array}\right] = \int 2\sin t\, dt = -2\cos t + C = \underline{\underline{-2\cos\sqrt{x} + C}}$$

c)
$$\int x\sqrt{7x^2+5}\, dx = \left[\begin{array}{l} t = 7x^2+5 \\ \frac{dt}{dx} = 14x \quad \frac{dt}{14} = x\,dx \end{array}\right] = \int \frac{\sqrt{t}}{14}\, dt = \frac{1}{21} t^{3/2} + C = \frac{(7x^2+5)^{3/2}}{21} + C$$

d)
$$\int x \cdot \frac{1}{\sqrt{x^2+5}}\, dx = \left[\begin{array}{l} t = x^2+5 \\ \frac{dt}{dx} = 2x \quad \frac{dt}{2} = x\,dx \end{array}\right] = \int \frac{1}{\sqrt{t}} \cdot \frac{1}{2}\, dt = \sqrt{t} + C = \underline{\underline{\sqrt{x^2+5} + C}}$$

e)

Sv: ja, d o a men det blir [illegible] svårare med b o c