3)

a)

$$\int \frac{1}{2x^2+1}\,dx = \frac{1}{2}\int \frac{1}{x^2+\frac{1}{2}}\,dx = \ldots$$

$$\int \frac{1}{x^2+a^2}\,dx = \frac{1}{a}\arctan\left(\frac{x}{a}\right) + C$$

$$\int \underset{g(x)}{\underbrace{e^x}}\,\overset{g'(x)}{\cos(5e^x)}\,dx = \frac{1}{5}\int \cos(\underset{u}{\underbrace{5e^x}})\underset{du}{\underbrace{5e^x}}\,dx = \frac{1}{5}\int \cos(u)\,du = \ldots$$

$$\int x^3\,dx = \frac{x^4}{4}$$

3b) *Primitivação por partes*

$$\int u' v = u v - \int u v'$$

$$\int (3x+5) \underbrace{e^{-3x}}_{u'} dx \quad \begin{cases} v = 3x+5 \Rightarrow v' = 3 \\ u' = e^{-3x} \Rightarrow u = \int e^{-3x} dx = \frac{-1}{3} e^{-3x} \end{cases}$$

(with $\underbrace{(3x+5)}_{v}$)

$$\Rightarrow \int (3x+5) e^{-3x} dx = (3x+5) \cdot \left(-\frac{1}{3} e^{-3x} \right) - \int \left(-\frac{1}{3} e^{-3x} \right) \cdot 3 \, dx$$

$$= -\frac{(3x+5)}{3} \cdot e^{-3x} + \int e^{-3x} dx = \dots$$

agora basta calcular este...