

Homework 55:

$$\textcircled{1} \int x e^{x^2} dx$$

$$u = x^2; du = 2x dx$$

$$\frac{1}{2} \int e^u du = \frac{1}{2} e^{x^2} + C$$

$$\textcircled{6} \int \frac{x}{\sqrt{x+9}} dx$$

$$\textcircled{2} \int \frac{\ln z^8}{z} dz$$

$$u = \ln z; du = \frac{1}{z} dz$$

$$\int u^8 du \rightarrow \frac{u^9}{9} \text{ then}$$

$$F(z) = \frac{\ln z^9}{9} + C$$

$$\textcircled{3} \int \frac{e^{4x}}{3+e^{4x}} dx$$

$$u = 3+e^{4x}; du = 4e^{4x} dx$$

$$\frac{1}{4} \int \frac{1}{u} du \rightarrow \frac{1}{4} \ln|u|$$

$$F(x) = \frac{1}{4} \ln|3+e^{4x}| + C$$

$$\textcircled{4} \int \frac{3e^{5y}}{\sqrt{y}} dy$$

$$u = 5\sqrt{y}; du = \frac{5}{2\sqrt{y}} dy$$

$$\frac{2}{5} \int 3e^u du \rightarrow 3e^u$$

$$F(y) = \frac{6}{5} e^{5\sqrt{y}} + C$$

$$\textcircled{5} \int \cos^5(7q) \sin(7q) dq$$

$$u = \cos(7q); du = -7\sin(7q) dq$$

$$\frac{-1}{7} \int u^5 du \rightarrow \frac{u^6}{6}$$

$$F(q) = \frac{-1}{35} (\cos^6(7q)) + C$$





