Math 19: Quiz 9 Solutions Name:

For full credit you must show your work. Partial credit may be given for incorrect solutions if sufficient work is shown.

Use the method of substitution to evaluate the following integrals.

1. (5 pts)

$$\int (x^2+3x+1)^9(2x+3)dx$$

$$u = x^2+3x+1 \implies \frac{du}{dx} = 2x+3 \implies du = (2x+3)dx$$

$$\begin{aligned}\int (x^2+3x+1)^9(2x+3)dx &= \int u^9 du \\ &= \frac{u^{10}}{10} + C \\ &= \boxed{\frac{(x^2+3x+1)^{10}}{10} + C}\end{aligned}$$

2. (5 pts)

$$\int 6xe^{x^2+8}dx$$

$$\begin{aligned}u = x^2+8 \implies \frac{du}{dx} = 2x &\implies du = 2xdx \\ &\implies 3du = 6xdx\end{aligned}$$

$$\begin{aligned}\int 6xe^{x^2+8}dx &= \int e^u \cdot 3du \\ &= 3\int e^u du \\ &= 3e^u + C \\ &= \boxed{3e^{x^2+8} + C}\end{aligned}$$