

I. Find the following antiderivatives and *verify your answers!*

1. $\int x^4 - 3x + \pi \, dx$

4. $\int -\sin(x)x^2 + \cos(x)2x \, dx$

2. $\int \cos(x) + \sqrt{x} \, dx$

5. $\int \frac{2xe^x - x^2e^x}{e^{2x}} \, dx$

3. $\int e^{x^3} 3x^2 \, dx$

6. $\int \cos(x^2)x \, dx$

II. Verify that $\int \tan(x) \, dx = -\ln(\cos(x)) + c$