Use Riemann sum(midpoints as sample points) and Simpson's Rule to approximate the following integrals, respectively, and compare the approximations with exact values of integrals.

1. $\int_0^2 e^x \, dx$ $\qquad\qquad$ $n = 4$

2. $\int_1^2 \ln x \, dx$ $\qquad\qquad$ $n = 4$

3. $\int_3^5 \sqrt{1 + x^2} \, dx$ $\qquad\qquad$ $n = 4$

4. $\int_0^\pi \sin x \, dx$ $\qquad\qquad$ $n = 6$

5. $\int_0^4 x^3 \, dx$ $\qquad\qquad$ $n = 4$

6. $\int_0^2 x^4 \, dx$ $\qquad\qquad$ $n = 4$

Hint: If you do not have a calculator, you can use wolfram alpha to calculate $e^{0.5}, sin(\frac{\pi}{12})$, ect.