Worksheet 4

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I. Evaluate the following integrals

1. $\int \frac{x^5+1}{x^3-3x^2-10x}dx.$
2. $\int e^{\sqrt{3x+2}}dx.$
3. $\int \frac{x}{\sqrt{3-x^4}}dx.$
4. $\int \frac{1}{x+\sqrt[3]{x}}dx.$
5. $\int x\sin(x)^2\cos(x)dx.$
6. $\int \frac{x\ln(x)}{\sqrt{x^2-1}}dx.$

II. Use your favorite approximation method to approximate $\int_0^4 x^3dx$ (use $n=4$ intervals). Evaluate the errors and compare them to the theoretical error bounds.

III. Determine whether each integral is convergent or divergent. Evaluate those that are convergent.

1. $\int_1^\infty \frac{e^{-\sqrt{x}}}{\sqrt{x}}dx.$
2. $\int_{-\infty}^\infty \cos(\pi t)dt.$
3. $\int_0^\infty \frac{dz}{z^2+3z+2}.$