Calculus II (2414): HOMEWORK 1

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Due: Tuesday, January 26, my office, by 5:00PM.

Remember to **show your work** and show it neatly.

Also, unless you're explicitly asked for an estimate, **leave your answers in exact form**. Don't convert 2/3 into .66667 or $\frac{\sqrt{2}}{\pi}$ into .450158.

1. **[10 points]** Compute $\frac{d^2}{dx^2}\left(\frac{1}{1+x^2}\right)^9$.

2. **[10 points]** Compute $\int_0^{\ln(\pi)} \mathrm{e}^{2x}\sin\left(\frac{\mathrm{e}^{2x}}{3}\right)\,dx$.

3. **[32 points]** Compute the following sums.

(a) $\sum_{j=2}^{4}\frac{1}{j}$ (b) $\sum_{n=0}^{3}3^n$ (c) $\sum_{k=16}^{100}\left(\sqrt{k+1}-\sqrt{k}\right)$ (d) $\sum_{n=4}^{40}\left(\frac{1}{k}-\frac{1}{k-1}\right)$

(e) $\sum_{m=1}^{10}m$ (f) $\sum_{n=5}^{17}3$ (g) $\sum_{k=0}^{4}(-1)^k$ (h) $\sum_{i=3}^{7}\cos(\frac{\pi i}{4})$

4. **[10 points]** #2, Section 6.1.

5. **[10 points]** #4, Section 6.1

6. **[15 points]** #26, Section 6.1

7. **[13 points]** #44, Section 6.1