

## Additional problems, due Tuesday Nov. 18

1. Use the method of Riemann sums to compute

$$\int_1^2 x^2 dx.$$

2. Use the method of Riemann sums to compute

$$\int_0^1 x^3 dx.$$

3. Use the method of Riemann sums to compute

$$\int_0^1 e^x dx.$$

**Hint 1.** Use the following summation formula: for any value  $r \neq 1$

$$\sum_{k=1}^n r^k = \frac{r - r^{n+1}}{1 - r},$$

where you should have  $r = e^{\frac{1}{n}}$ .

**Hint 2.** Recall the definition of  $e$  as that base for which

$$\lim_{n \rightarrow \infty} \frac{e^{\frac{1}{n}} - 1}{\frac{1}{n}} = 1.$$