Use Maple to answer the following questions.
Turn in a print out of your Maple work — including any requested graphs.

1. Farmer Hicks finds that his "mini-cows" have an average height of 36 inches (= 3 feet) with a standard deviation of 6 inches. Assume that the mini-cow heights are normally distributed and calculate the probability that a mini-cow is more than 2 feet tall (2 feet = 24 inches).

2. If farmer Hicks wants to buy a cow trailer to transport his mini-cows, how tall does his trailer need to be to accomodate 95% of his mini-cows? (He doesn't need to transport the tallest 5% of his mini-cows since they're not that "mini.")

3. By the p-series test we know that $\sum_{k=1}^{\infty} \frac{1}{k^2}$ converges. Use Maple to find the sum of this series.

4. Let $f(x) = \frac{1}{x\sqrt{x^2+1}}$. Plot $f(x)$ for $1 \leq x \leq 10$. It looks like $f(x)$ is decreasing (and positive). Compute $f'(x)$ and notice that in fact $f'(x) < 0$ when $x \geq 1$ (so $f(x)$ is decreasing).

5. Use the integral test to show that $\sum_{k=1}^{\infty} \frac{1}{k\sqrt{k^2+1}}$ converges. Moreover, find lower and upper bounds for the sum of the series.

6. Sum the first 10,000 terms of the series $\sum_{k=1}^{\infty} \frac{1}{k\sqrt{k^2+1}}$ — **don't forget to use an "evalf" command** — and then use an integral to find an upper bound on the error of this estimate.

7. Find (the smallest) N so that the partial sum $\sum_{k=1}^{N} \frac{1}{k\sqrt{k^2+1}}$ approximates the series sum within 0.001.
   Hint: Use the command "assume($N > 0$);" to let Maple know that N should be positive.

DUE: Tuesday, November 30$^{\text{th}}$.