You will find this Homework posted in the webbook:
http://www.cs.odu.edu/~webbook
Successively click on CS281 Class Information, and HomeWork. Since I am making up these
problems, there could be corrections or clarifications during the week; I will post these here as well.

Recall that you are permitted to discuss the material in the text book and the lectures with
other students, but that you are not permitted to discuss the solutions of Home Work problems
with others or copy their solutions. You are also responsible for ensuring that other students do
dnot copy your solutions.

Read sections in the textbook on Induction and Strong Induction before doing these problems.

1. Show that the sum of the first $n$ even integers is $n^2 + n$.

2. Show that $1^2 + 3^2 + 5^2 + \ldots + (2n - 1)^2 = (4n^3 - n)/3$.

3. Show that $n^2 \geq (3n + 1)$ for all $n \geq 4$.

4. Show that $n^3 - 4n + 6$ is divisible by 3 for all positive integers.

5. If the post office sells only 5 and 9 cent stamps, show that any postage of 35 cents or greater
can be paid for using only these stamps.

**Bonus Question.** You do NOT have to do this problem; however, I include it for those who
would like a challenge. You will receive extra credit for a correct answer.

Notice that

\[
\begin{align*}
-1 &= -1 \\
-1 + 4 &= (1 + 2) \\
-1 + 4 - 9 &= -(1 + 2 + 3) \\
-1 + 4 - 9 + 16 &= (1 + 2 + 3 + 4)
\end{align*}
\]

Guess the pattern for $n$ terms, and prove it by induction.