

UWO CS2214

Tutorial #5

**Problem 1** Show by induction that for all  $n \geq 1$  we have

$$\sum_{i=1}^{i=n} (i+1) = \frac{n(n+3)}{2} \quad (1)$$

**Solution 1** [http://www.csd.uwo.ca/~moreno/cs2214\\_moreno/tut/Problem\\_1.PDF](http://www.csd.uwo.ca/~moreno/cs2214_moreno/tut/Problem_1.PDF)

**Problem 2** Prove by induction that for all  $n \geq 3$  we have

$$4^{n-1} > n^2 \quad (2)$$

**Solution 2** <https://www.iitutor.com/mathematical-induction-inequality/>

**Problem 3** Prove by induction that for all  $n \geq 3$  we have

$$n^2 \geq 2n + 3 \quad (3)$$

**Solution 3** <https://www.csm.ornl.gov/~sheldon/ds/ans2.3.2.html>

**Problem 4** Prove by induction that for all  $n \geq 1$  the integer  $6^n - 1$  is divisible by 5.

**Solution 4** <http://home.cc.umanitoba.ca/~thomas/Courses/InductionExamples-Solutions.pdf>