University of Toronto St. George Campus Department of Computer Science
CSC 148H / L0101 Summer 2000

# Tutorial Quiz #7 — Solutions

Using the method of "proof by cases", complete the following proof. (You must use the proof format outlined in the lecture slides.)

**Claim:** For every positive integer $n$, $n(n+1)$ is even.

**Proof (Answer):**

Let $n$ by an arbitrary positive integer.

Then, either $n$ is even or $n$ is odd.

Assume that $n$ is even.

Then, $n(n+1)$ is even.

Assume that $n$ is odd.

Then, $n+1$ is even, so $n(n+1)$ is even.

In every case, $n(n+1)$ is even.

Hence, for all positive integers $n$, $n(n+1)$ is even.

**Marking Scheme:**

A. 1 mark for clearly using a proof by cases

B. 1 mark for the form of the proof (making assumptions for each case, stating conclusions, using proper indentation)

C. 1 mark for having cases "$n$ is even" and "$n$ is odd"

D. 1 mark for the proof when $n$ is even

E. 1 mark for the proof when $n$ is odd

**Common Errors:**