

MATHEMATICS 300 — FALL 2009

Introduction to Mathematical Reasoning

H. J. Sussmann

INSTRUCTOR'S NOTES

(November 5, 2009)

1 Homework assignment No. 10, due on Thursday November 12.

1. Prove the following statement:

$$(\forall n \in \mathbb{N})(\forall x \in \mathbb{R}) \left((x > 0 \implies (1+x)^n \geq 1 + nx + \frac{n(n-1)}{2}x^2) \right).$$

2. Book, pages 106-107, Problem 8, all nonstarred items except (e), (u) and (v). *WARNING: Problem 8, Part (r), should be*

$$\prod_{i=1}^n \left(1 - \frac{1}{i+1} \right) = \frac{1}{n+1}.$$

Some copies of the sixth edition of our textbook have

$$\prod_{i=1}^{n+1} \quad \text{instead of} \quad \prod_{i=1}^n.$$

This is wrong. If your book is one of those that have the wrong formula, then make the correction.

3. Book, pages 107-108, Problem 9, Part f.
4. Book, pages 109-110, Problem 15, Part c.

