

QUIZ # 6 - MATH 1090 - NOVEMBER 8, 2002

MIKE ZABROCKI - SECTION C - MWF 3:30- 4:20
PLEASE SIT EVERY OTHER SEAT. NO BOOK. NO NOTES. NO THEOREM LIST.

- (1) Determine whether the following quantifiers are true or false. The domain of the bound variable i in each of the expressions is the set of integers and $even.k$ is a function which returns *true* if k is even and *false* if k is odd. Justify your answer. If you fail to provide some explanation for your answer you will not receive credit for that question.
- (a) $(\forall i | 1 < i < 3 : even.i)$
true. $1 < i < 3 \equiv (i = 2)$ so by the one point rule, this is $even.2$ which is *true*.
 - (b) $(\forall i | 1 < i < 2 : even.i)$
true. $1 < i < 2 \equiv false$ for all i , so by (8.13) this is *true*.
 - (c) $(\exists i | 1 \leq i \leq 3 : even.i)$
true. $1 < i < 3 \equiv (i = 2)$ so by the one point rule, this is $even.2$ which is *true*.
 - (d) $(\exists i | true : false)$
false. There does not exist an i for which the expression *false* is satisfied.
 - (e) $(\forall i | false : even.i)$
true. by (8.13).
 - (f) $(\exists i | (1 \leq i \leq 10) \wedge even.i : even.(i/2))$
true. $(1 \leq i \leq 10) \wedge even.i \equiv (i = 2) \vee (i = 4) \vee (i = 6) \vee (i = 8) \vee (i = 10)$ and if $i = 4$ or $i = 8$ then $even.(i/2)$ is *true* so there exists an i for which $even.(i/2)$ is satisfied.