

## Homework Assignment # 3

Due: 2006–10–06 (Friday)

1. Determine and write down the inverse, converse, and contrapositive of:  
“If Thanksgiving is on Thursday, then you are American.”
2. In this question, let the universe of discourse  $\mathcal{U}$  be the set of all integers. Determine whether the following statements are true. Briefly justify each of your answers.
  - (•) [*example*]  $\forall x \exists y \ x < y^2$ .      True. Take  $y = x$ .
  - (a)  $\forall x \exists y \ x = y^2$ .
  - (b)  $\exists x \ 5 + x = 10$ .
  - (c)  $\exists x \forall y \ x + y = y$ .
  - (d)  $\forall x \exists y \ x^2 = y$ .
  - (e)  $\forall x \ 5 + x = 10$ .
  - (f)  $\exists x \forall y \ [(x = y + 1) \vee (x = 0)]$ .

from *Gersting* (sixth edition):

3. Section 1.3: Questions: 1, 2, 10, 11, 18, 21. (fifth edition: 1, 2, 7, 8, 15.)