Math 5370 **In-Class Activity 1** **Fall 2007**

Time: 30 minutes.

1. The variable names x and y stand for arbitrary integers. Which of the following statements are true, and false, respectively? Why?

   - $P_1:$ $\forall x \forall y$: $x^2 + y = 10$.
   - $P_2:$ $\forall y \forall x$: $x^2 + y = 10$.
   - $P_3:$ $\exists x \exists y$ such that $x^2 + y = 10$.
   - $P_4:$ $\exists y \exists x$ such that $x^2 + y = 10$.
   - $P_5:$ $\forall x \exists y$ such that $x^2 + y = 10$.
   - $P_6:$ $\forall y \exists x$ such that $x^2 + y = 10$.
   - $P_7:$ $\exists x$ such that $\forall y$: $x^2 + y = 10$.
   - $P_8:$ $\exists y$ such that $\forall x$: $x^2 + y = 10$.

2. Are there pairs among the statements above that are equivalent? Why?

3. Negate statements P_1, P_4 and P_7.