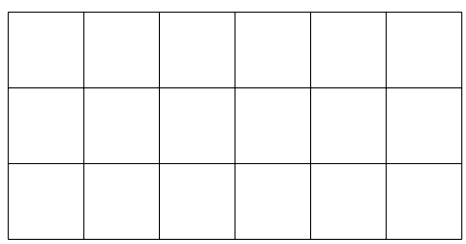
Spring 2015, QUIZ 4, MATH-201,   NAME: Score...............

You have to show your work and write down your proof.

1: Negate the following formula and write it in prenex normal form

$$[\neg(\forall z, A(z))] \text{ xor } (\exists x, B(x))$$

2: Show that every grid $3 \times n$, where n is even natural number can be tiled with pieces 2×1 and 1×2. Use induction on n. Example of grid $3 \times n$ for $n = 6$.



3: Let there be n lines on the plain, no two parallel, where $n \geq 2$. Then they all intersect in one point.

Proof. We use proof by induction.
Basic step: $n = 2$. Two lines are clearly intersection in one point.
Induction step: Let there be n lines $l_1, \ldots, l_n$. By induction hypothesis, $l_1, \ldots, l_{n-1}$ and $l_2, \ldots, l_n$ intersect in points p_1 and p_2 respectively. Since a point is determined by just two lines, $p_1 = p_2$ and we have that all n lines intersect in the one point p_1. $\square$

Find what is wrong with the proof.