Examlet 4A Foundations of Advanced Math 4/19/13

1. a) State the definition of a reflexive relation.

b) Give an example of a relation on the set $\{a, b, c\}$ which is transitive but not symmetric.

2. Let $S = \{1, 2, 3, 4, 5\}$, and consider the partition $\mathcal{P} = \{\{1, 2\}, \{3, 4, 5\}\}$ of S. Write the equivalence relation \sim corresponding to \mathcal{P} .

3. a) Express the definition of an injective function formally in terms of ordered pairs.
b) Express the definition of an even function formally in terms of ordered pairs.

4.		<i>S</i> be a set and \mathcal{P} a partition of <i>S</i> . The relation on <i>S</i> defined by $a \sim b$ iff $\exists P \in \mathcal{P}$ for which $a, b \in P$ is a reflexive relation.
	b)	The relation on S defined by $a \sim b$ iff $\exists P \in \mathcal{P}$ for which $a, b \in P$ is a symmetric relation.
	c)	The relation on <i>S</i> defined by $a \sim b$ iff $\exists P \in \mathcal{P}$ for which $a, b \in P$ is a transitive relation.

5.	Say	y that two vertices v_1 and v_2 of a graph G are propinquous iff there exists a walk between that contains exactly one vertex other than v_1 and v_2 .
	a)	Is the relation of being propinquous reflexive?
	b)	Is the relation of being propinquous symmetric?
	c)	Is the relation of being propinquous transitive?