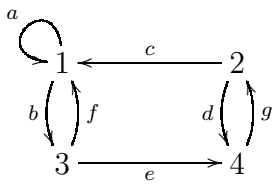
INF223 Categories for Software Engineering
Spring 2006

— Exercise Set 2 , for group meeting 03.02.2006 —

1. Give for the following graph G the sets G_0, G_1, G_2, G_3 and G_4.



2. Define a reasonable concept of morphism for pre-orders. Show that your morphisms define a category **PRE** of pre-orders and characterize the isomorphisms in **PRE**.

3. Prove the following statement for the category **GRAPH**: A graph homomorphism $\phi = (\phi_0, \phi_1) : G \to H$ is mono in **GRAPH** iff $\phi_0 : G_0 \to H_0$ and $\phi_1 : G_1 \to H_1$ are mono's in **SET**, i.e., injective maps.