1. Which of the following diagrams says "g is a right inverse of f"?



2. If we let *e* be the identity permutation, $f = (1 \ 2 \ 3)$ and $g = (1 \ 2)$ then the group S_3 can be presented as

$$S_3 = \langle f, g | f^3 = g^2 = e, gf = f^2 g \rangle$$

By choosing the right matrices for e, f, and g, the group GL(2, 2) can also be presented as

$$GL(2,2) = \langle f, g | f^3 = g^2 = e, gf = f^2 g \rangle$$

Choose the right matrices for e, f, and g:

(1	1	((1	0)	(0	1
(1	0)	(0	1	1	0)

3. Solve the equations, or explain why no solution exists:

(a) Solve 5x + 6 = 10 for $x \in \mathbb{Z}/11\mathbb{Z}$

(b) Solve 5x + 6 = 10 for $x \in \mathbb{Z}/12\mathbb{Z}$