PMAT 319 Winter 2016.
Questions For Quiz 2

1. Make sure you can prove "star" theorems: Theorem 5.1, Theorem 5.2 and Theorem 7.2.

2. Prove that if m, n, l are parralell lines then $\sigma_l\sigma_n\sigma_m$ is a reflection in a line.

3. Prove that if m, n, l are lines that are concurrent at a point then $\sigma_l\sigma_n\sigma_m$ is a reflection in a line.

4. Let $ABCD$ be a square. Let $a = \overleftrightarrow{AB}$, $b = \overleftrightarrow{BC}$, $c = \overleftrightarrow{CD}$, $d = \overleftrightarrow{DA}$, $m = \overleftrightarrow{BD}$ and $l = \overleftrightarrow{AC}$.

(a) Show that $\alpha = \sigma_d\sigma_c\sigma_b\sigma_a$ is a product of two reflections. Thus, α is either a rotation or a translation. Describe α.

(b) Repeat (a) but with $\alpha = \sigma_c\sigma_d\sigma_a\sigma_b$.

(c) Repeat (a) but with $\alpha = \sigma_d\sigma_b\sigma_c\sigma_a$.

(d) Repeat (a) but with $\alpha = \sigma_a\sigma_b\sigma_c\sigma_a$.

(e) Repeat (a) but with $\alpha = \sigma_c\sigma_m\sigma_l\sigma_a$.

(f) Repeat (a) but with $\alpha = \sigma_m\sigma_l\sigma_a\sigma_m$.

(g) Show that $\beta = \sigma_l\sigma_m\sigma_l$ is a reflection. Describe the line of reflection of β.

(h) Show that $\zeta = \sigma_b\sigma_m\sigma_a$ is a reflection. Describe the line of reflection of ζ.

(i) Show that $\varphi = \sigma_a\sigma_m\sigma_a$ is a reflection. Describe the line of reflection of φ.