

# MAT 150A Homework 7

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- 1.
2. *Proof.* Let  $m = t_a \rho_\theta r$

$$\begin{aligned} m^2 &= (t_a \rho_\theta r)(t_a \rho_\theta r) \\ &= t_a \rho_\theta (r t_a) \rho_\theta r \\ &= t_a \rho_\theta (t_{a'} r) \rho_\theta r \\ &= t_a \rho_\theta t_{a'} (r \rho_\theta) r \\ &= t_a \rho_\theta t_{a'} (\rho_{-\theta} r) r \\ &= t_a \rho_\theta t_{a'} \rho_{-\theta} r^2 \\ &= t_a (\rho_\theta t_{a'}) \rho_{-\theta} \\ &= t_a (t_{a''} \rho_\theta) \rho_{-\theta} \\ &= t_a t_{a''} (\rho_\theta \rho_{-\theta}) \\ &= t_a t_{a''} (\rho_{\theta-\theta}) \\ &= t_a t_{a''} \\ &= t_{a+a''} \end{aligned}$$

So  $m^2$  is just a translation by  $a + a''$ , where  $a'' = \rho(r(a))$

□

- 3.
- 4.
- 5.
6. (a)  
(b)  
(c)