iv) $Orb(M_2) = (M_2, M_4, M_6)$

b) i) $Stab(S_1) = \{e\}$

ii) $Stab(S_2) = \{e\}$

iii) $Stab(M_1) = \{e, r\}$

iv) $Stab(M_2) = \{e, t\}$

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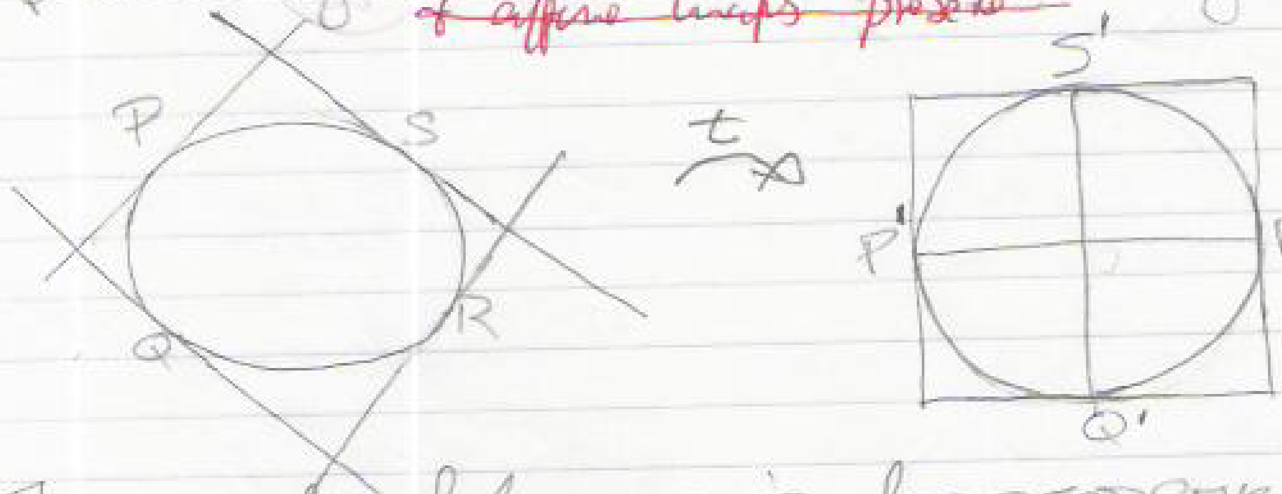
7) There is an affine transformation that maps the ellipse to the unit circle. Since the property of being parallell is preserved by affine transformations it follows that the image of the parallelogram is another parallelogram

~~of affine maps preserve~~



The property of tangency is also preserved.
The radius of a circle meets the tangent on the circumference of the circle at right angles. Draw radii from the centre of the circle to the points P', Q', R', S', then each of the angles P'OS', S'OR', R'OQ', Q'OP' is equal to each other and equal to 90° (360/4 = 90°). Also OP' = OS' = OR' = OQ' = 1, the radius of the unit circle. Each triangle formed by consecutive radius and the chords between the points at which they meet the circle is therefore isoseles, and each triangle so formed can be rotated onto any other by a rotation through multiples of 90° clockwise or anticlockwise.
The chords S'P', P'Q', Q'R' and S'R' are rotated