Section 1: Determinants and inverses

Crucial points

1. **Remember the rule for the inverse of a matrix product**
   For square matrices **M** and **N**, $(MN)^{-1} = N^{-1}M^{-1}$.

2. **Make sure you understand the significance of a zero determinant for a matrix transformation**
   For a matrix with zero determinant, all points on the plane are mapped to a straight line through the origin, and each set of object points which are mapped to a single image point all lie on a straight line.

3. **Remember the physical significance of the determinant**
   The determinant of a 2x2 matrix represents the **area** scale factor of the associated transformation, not just the scale factor (the area scale factor is the square of the scale factor). The determinant of a 3x3 matrix represents the volume scale factor of the associated 3D transformation. If the determinant is negative, the transformation reverses the orientation of the shape.