



LUND
UNIVERSITY

Linear Algebra 2
Saturday, 1 April 2017
Duration: 08:00–13:00

Centre for Mathematical Sciences
Mathematics, Faculty of Science

Answers

1. $y = \frac{1}{2}t^2 + \frac{1}{10}t + \frac{7}{10}$.
2. Hyperboloid of one sheet.
3. E.g.

$$T = \begin{bmatrix} \frac{1}{\sqrt{11}} & \frac{1}{\sqrt{2}} & \frac{3}{\sqrt{22}} \\ \frac{3}{\sqrt{11}} & 0 & -\frac{2}{\sqrt{22}} \\ \frac{1}{\sqrt{11}} & -\frac{1}{\sqrt{2}} & \frac{3}{\sqrt{22}} \end{bmatrix} \quad \text{and} \quad D = \begin{bmatrix} 11 & 0 & 0 \\ 0 & -11 & 0 \\ 0 & 0 & -11 \end{bmatrix}.$$

4. The axis of rotation is the line through the origin spanned by the vector $(-1, 1, 1)$. The cosine of the angle of rotation is $-\frac{1}{7}$. The rotation appears to be anticlockwise when looking from the point $(-1, 1, 1)$ towards the origin.