Mathematical Methods
B
Spring 2022

Norwegian University of Science
and Technology
Department of Mathematical
Sciences

Exercise set 7

9.3.55 Find eigenvectors and eigenvalues to the matrix

$$\mathbf{A} = \begin{bmatrix} 2 & 1 \\ 2 & 3 \end{bmatrix}.$$

9.4.7 Find the length of $x = \begin{bmatrix} 1 \\ 3 \end{bmatrix}$.

9.4.14 Normalize the vector $x = \begin{bmatrix} 0 \\ -3 \\ 1 \\ 3 \end{bmatrix}$.

4 Find the angle between $x = \begin{bmatrix} 0 \\ 1 \\ -3 \end{bmatrix}$ and $y = \begin{bmatrix} -3 \\ 1 \\ 1 \end{bmatrix}$.

9.4.32 A triangle has vertices at coordinates

$$P = (0,0), \quad Q = (0,3) \quad \text{and} \quad R = (5,0).$$

(a) Use basic trigonometry to compute the lengths of all three sides and the measures of all three angles.

(b) Use the methods from the lectures to repeat (a).

9.4.65 Given is the plane through $r_0 = (0, -2, 1)^\top$ and perpedicular to $n = (-1, 1, -1)^\top$. Find a line through $(5, -1, 0)^\top$ and that is parallel to the plane.

Deadline: Sunday, March 6, 2022 (digitally as a single pdf-file via Blackboard)