



Norwegian University of Science
and Technology
Department of Mathematical
Sciences

MA1201 Linear Algebra and Geometry

Exercise set 06

Compulsory exercises

Hand in your solutions to these exercises. All answers must be justified.

Chapter 3.5 - Cross product

Exercise 1 Do exercise 14 in chapter 3.5 of Elementary Linear Algebra.

Exercise 2 Do exercise 22 in chapter 3.5 of Elementary Linear Algebra.

Chapter 4.1 - Real vector spaces

Here are the vector space axioms as listed on page 203.

1. If \mathbf{u} and \mathbf{v} are in V , then $\mathbf{u} + \mathbf{v} \in V$.
2. $\mathbf{u} + \mathbf{v} = \mathbf{v} + \mathbf{u}$
3. $(\mathbf{u} + \mathbf{v}) + \mathbf{w} = \mathbf{u} + (\mathbf{v} + \mathbf{w})$
4. There exists an object in V , called the zero vector, that is denoted by $\mathbf{0}$ and has the property that $\mathbf{0} + \mathbf{u} = \mathbf{u} + \mathbf{0} = \mathbf{u}$ for all \mathbf{u} in V .
5. For each \mathbf{u} in V , there is an object $-\mathbf{u}$ in V , called a negative of \mathbf{u} , such that $\mathbf{u} + (-\mathbf{u}) = (-\mathbf{u}) + \mathbf{u} = \mathbf{0}$.
6. If k is any scalar and $\mathbf{u} \in V$, then $k\mathbf{u} \in V$.
7. $k(\mathbf{u} + \mathbf{v}) = k\mathbf{u} + k\mathbf{v}$
8. $(k + m)\mathbf{u} = k\mathbf{u} + m\mathbf{u}$
9. $k(m\mathbf{u}) = (km)(\mathbf{u})$
10. $1\mathbf{u} = \mathbf{u}$

Exercise 3 Do exercise 3-9 in chapter 4.1 of Elementary Linear Algebra.

Chapter 4.2 - Subspaces

Exercise 4 Do exercise 6 in chapter 4.2 of Elementary Linear Algebra.