

Høsten 2015

# FYS100 Fysikk

## Problems week 36

Have a go at these:

First some problems from the book:

- 3.7, 3.8, 3.10 (ignore the word *graphically*).
- 3.23, 3.36

**Additional Problem 1:** Consider the vectors (in cartesian coordinates, given some basis and coordinate system),

$$\vec{\mathbf{A}} = (-1, 4), \quad \vec{\mathbf{B}} = (1, 2), \quad \vec{\mathbf{C}} = (2, 1). \quad (1)$$

Compute

- The projection of  $\vec{\mathbf{A}}$  onto  $\vec{\mathbf{B}}$ .
- The projection of  $\vec{\mathbf{A}}$  onto  $\vec{\mathbf{C}}$ .

Is the sum of the projections equal to the original vector  $\vec{\mathbf{A}}$ ? Why?

Find the decomposition of  $\vec{\mathbf{A}}$  onto  $\vec{\mathbf{B}}$  and  $\vec{\mathbf{C}}$ . Use whatever method you find simplest.

**Additional Problem 2:** Consider the vectors in 3-D

$$\vec{\mathbf{A}} = (1, 2, 1), \quad \vec{\mathbf{B}} = (2, 1, 2). \quad (2)$$

Compute

- $\vec{\mathbf{A}} \times \vec{\mathbf{B}}$ .
- $\vec{\mathbf{A}} \cdot \vec{\mathbf{B}}$ .

Find the relative angle between the vectors, using either the scalar or the vector product. Do they agree?