Høsten 2015

FYS100 Fysikk
Problems week 40

Have a go at these. And for each, make a little sketch to illustrate the solution.

Some problems from the book:

- 6.6, 6.7, 6.20, 6.21, 6.31, 6.41, 6.65.

Additional problem 1 (Obl 2014-2)
A child is at a playground, and chooses to try the *spinning disc*. The radius of the disc is 2.00 m, and the coefficient of static friction between child-surface and disc-surface is $\mu_s = 0.350$.
In the following questions, you must provide algebraic equations as well as final numbers. You must also draw some relevant sketches, illustrating the problem.

b) The evil big brother now spins the disc with $\omega = 2.00$ rad/s. At what distance from the centre of the disc should the kid sit, to avoid falling off?

c) How quickly can he stop the disc, without her sliding in any direction (neither forwards, backwards, inwards or outwards)?

Additional problem 2
Consider a small ball dropping under the effect of gravity in a fluid. It experiences a resistive force proportional to the velocity,

$$\overrightarrow{\mathbf{R}} = -b_1 \overrightarrow{\mathbf{v}}. \tag{1}$$

a) If the ball is initially at rest, what is its speed as a function of time? Choose the y-axis to be positive downwards.

b) What is the position as a function of time, choosing the initial position to have $y = 0$.