opg 1

$$\frac{d^2}{dt^2}y(t) + 2\frac{d}{dt}y(t) + 2y(t) = 0$$

with $y(0) = 1$ and $y'(0) = -1$

$$y''(t) + 2y'(t) + 2y(t) = 0$$

$$f''(t) = s^2 \cdot F(s) - sf(0) - f'(0)$$

$$f'(t) = sF(s) - f(0)$$

We now input the table functions

$$s^2 \cdot Y(s) - s \cdot 1 + 1 + 2 \cdot (s \cdot Y(s) + 1) + 2Y(s) = 0$$

$$Y(s)(s^2 + 2s + 2) - s - 1 = 0$$

$$Y(s) = \frac{s+1}{s^2+2s+2}$$

vi faktorisere nævneren.

$$Y(s) = \frac{s+1}{(s+1)^2+1}$$ brug tabel til invers Laplace transformation

$$e^{at} \cdot \cos(bt) = \frac{s-a}{(s-a)^2+b} = \frac{s-(-a)}{(s-(-a))^2+b}$$

using the table we get:

$$y(t) = e^{-t} \cdot \cos(t)$$