

Figure 1: Funksjonen i oppgave 8

LF 7

Oppgave 1: Funksjonar: $t(u_0(t) - u_2(t))$, $e^{-t}(u_0(t) - u_\pi(t))$, $(t-3)u_3(t)$, $2t^2 \cdot u_{\frac{5}{2}}(t)$.

Laplacetransformasjonar: $\frac{1-3e^{-2s}}{s^2}$, $\frac{1-e^{-\frac{1}{2}\pi(s+1)}}{1+s}$, $\frac{e^{-3s}}{s^2}$, $\frac{1}{2} \frac{e^{-\frac{5}{2}s}(25s^2+20s+8)}{s^3}$

Oppgave 2: a) $\frac{1}{2}(t-2)^2 e^{t-2} u_2(t)$, b) $4u_2(t) - 8u_5(t)$

c) $\frac{1}{4} \sin(2t)(u(t) - u_\pi(t)) = \frac{1}{4} \sin(2t)u(\pi - t)$

Oppgave 3: $\frac{1}{2} \sin(2t) + \frac{4}{3}(\cos(t) + \cos(2t))(1 - u_\pi(t))$,

Oppgave 4: $x(t) = e^{-t+1}u_1(t)$, $x(t) = e^{-2t} + e^{-2t+4}u_2(t)$

Oppgave 5: $x(t) = te^{-t}u(t)$,

$x(t) = \frac{1}{2}(1(u_1(t) - u_2(t)) - e^{-t+1}(\cos(t-1) + \sin(t-1))u_1(t) - e^{-t+2}(\cos(t-2) + \sin(t-2))u_2(t))$

Oppgave 6: a) $y(t) = \sin(4t) \cdot u_{3\pi}(t)$,

b) $y(t) = \frac{e^{-2t}}{\sqrt{2}}(e^{-2t} \sin(\sqrt{2}t) + e^4 \sin(\sqrt{2}t - 2\sqrt{2}))u_2(t)$

$+ \frac{u_1(t)}{6}(1 - e^{1-2t}(\cos(\sqrt{2}t - \sqrt{2}) + \sin(\sqrt{2}t - \sqrt{2})))$

Oppgave 8: $x(t) = e^{-t+1} \sin(t-1)u_1(t) + e^{-t} \sin(t)$. Funksjonen er over.

Merk at løysinga ikkje er deriverbar.

Oppgave 9: $y(t) = \sum_{n=0}^{\infty} \sin(t - n\pi)u_{n\pi}(t) = \sin(t) \sum_{n=0}^{\infty} (-1)^n u_{n\pi}(t)$. Skissa er under.

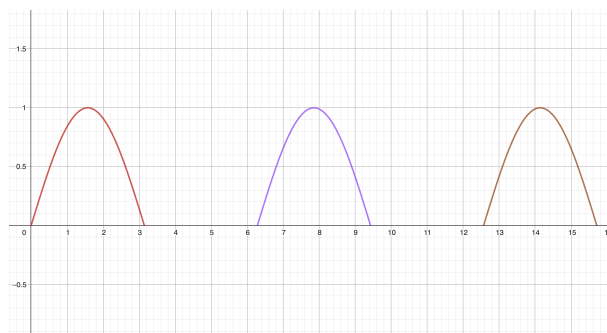


Figure 2: Funksjonen i oppgave 9