

LF 6

Oppg ave 1: a) $\frac{s^2-16}{(s^2+16)^2}$ b) $\frac{1}{(s-a)^2}$ c) $\frac{1}{2s} + \frac{1}{2} \frac{s}{s^2+16}$

Oppg ave 2: a) $6 \left(1 - e^{-\frac{1}{3}t}\right)$, b) $\frac{5}{\pi^2} e^{2\pi t} - \frac{10t}{\pi} - \frac{5}{\pi^2}$,

c) $-\frac{1}{4} \cos(2t) - \sin(2t) + \frac{1}{4} + 2t$

Oppg ave 3: a) $y(t) = \frac{3}{2} e^{-2t}$, b) $y(t) = 6 \left(e^{\frac{1}{2}t} + e^{-\frac{1}{2}t}\right)$,

c) $y(t) = \frac{4}{5} e^{2t} + \frac{1}{5} e^{-3t}$.

Oppg ave 4: a) $y(t) = \frac{8}{3} e^{-\frac{2}{3}t} - \frac{3}{5} \cos(2t) - \frac{9}{5} \sin(2t)$,

b) $y(t) = e^{-t} + \frac{1}{3} \sin(3t) - \cos(3t)$,

c) $y(t) = 2e^{2t} + e^t - 1 + 2t$

Oppg ave 5: a) $\tilde{y}(t) = \frac{7}{2} e^{-3t} - \frac{1}{2} e^t$, $y(t) = \frac{7}{2} e^{-3t+6} - \frac{1}{2} e^{t-2}$

b) $\tilde{y}(t) = 4e^{6t}$, $y(t) = 4e^{6(t+1)}$,

Oppg ave 6: a) $y(t) = 2e^{-t}$ b) $y(t) = -1220000e^{-10t} - 600000e^{3t}$,

c) $y(t) = \cos(10t) + \frac{10}{99} \sin(10t) - \frac{1}{99} \sin(t)$.

Oppg ave 7: a) $\frac{s^2+2s}{((s+1)^2+1)^2}$, $\frac{2s\omega}{(s^2+\omega^2)^2}$, $\frac{n!}{(s-k)^{n+1}}$

b) $\frac{e^{-bt} - e^{-at}}{t}$, $\frac{t}{8} \sin(4t)$.