

LF 5

Oppg ave 1: a) $\mathcal{L}(t)(s) = \frac{1}{s^2}$, $\mathcal{L}(e^{at})(s) = \frac{1}{s-a}$

Oppg ave 2: $\mathcal{L}(e^{at} \cos(bt))(s) = \frac{s-a}{(s-a)^2+b^2}$, $\mathcal{L}(e^{at} \sin(bt))(s) = \frac{b}{(s-a)^2+b^2}$.

Oppg ave 3: $\frac{2}{s^2} + \frac{8}{s}$, $\frac{a^2}{s} - \frac{2ab}{s^2} + \frac{2b^2}{s^3}$, $\frac{1-e^{-3s}}{s}$

Oppg ave 4: $\frac{t^3}{3} - \frac{2t^5}{5}$, $\frac{1}{9} \cos(\frac{\pi}{6}t)$, $\frac{e^{-bt}-e^{-at}}{a-b}$

Oppg ave 5: $\frac{6}{(s+2)^4}$, $\frac{k(s+a)}{(s+a)^2+b^2}$, $\frac{32\pi}{(2s+1)^2+64\pi^2}$,

$\frac{s-1}{(s-1)^2+1} - \frac{s+1}{(s+1)^2+1} = \frac{2s^2-4}{s^4+4}$

Oppg ave 6: $\pi t^2 e^{-\pi t}$, $\frac{3}{4} t^5 e^{-\sqrt{3}t}$, $\frac{1}{4} e^{-t} (12 \cos(2t) + \sin(2t))$, $e^{3t} - e^{-t}$,

Oppg ave 7: Variabelskiftet $u = ct$ gjer jobben.**Oppg ave 8:** Nei. Integralet konvergerer ikkje, s a laplacetransformasjonen fins ikkje.

Oppg ave 9: a) $\frac{3}{x-2} - \frac{2}{x-1}$, $\frac{4}{x+3} + \frac{3}{x-2}$, $\frac{2}{x+3} + \frac{3}{x-2}$

b) $\frac{1}{2(x-1)} - \frac{1}{2(x+1)}$, $\frac{4}{x+6} - \frac{1}{x+1}$, $\frac{3}{2(x+1)} - \frac{1}{2(x+3)}$

Oppg ave 10: $x+1 - \frac{4}{x+1}$, $x^3 + 3x^2 - 4x + 1 + \frac{3x+1}{x^2+x+1}$, $1 + \frac{1}{x} - \frac{4x+1}{4x^2+1}$, $x + 1 + \frac{x+2}{x^2+2x+4} + \frac{2}{x+1}$.

Oppg ave 11: a) $\frac{-1}{2(x^2+1)} - \frac{1}{4(x+1)} + \frac{1}{4(x-1)}$, $\frac{x+1}{x^2+1} - \frac{2}{x+1}$, $-\frac{t+1}{t^2+1} + \frac{1}{t-1}$

b) $\frac{2-x}{x^2+2x+2} + \frac{1}{x-1}$

Oppg ave 12: $\frac{-2}{3x^2} - \frac{2}{9x} + \frac{2}{9(x-3)}$, $\frac{1}{x+2} - \frac{2}{(x+2)^2}$, $\frac{2x}{x^2+1} + \frac{1}{(x^2+1)^2}$