



# MATEMATIK F2

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Ugeseddel 6

Uge 41 1999

Tekst til opgaver i afsnit 6.1 i 7. ed. (5.1 i 8. ed.):

Find the Laplace transforms of the following functions:

Opgave 1:  $3t + 4$

Opgave 3:  $t^2 + at + b$

Opgave 9:  $\cos^2 \omega t$

Opgave 16:  $\sin t \cos t$

Opgave 17: Afsnit 5.1 opgave 11 ( $f(t) = k$  for  $0 \leq t < c$ ;  $f(t) = 0$  for  $t \geq c$ ).

Find  $f(t)$  if  $F(s) = \mathcal{L}\{f(t)\}$  is as follows

Opgave 27:  $\frac{5}{s+3}$

Opgave 36:  $\frac{4(s+1)}{s^2-16}$

Tekst til opgaver i afsnit 6.2 i 7. ed. (5.2 i 8. ed.):

Opgave 1: Using (1) and (2) find the transform  $\mathcal{L}\{\cos^2 t\}$ .

Opgave 9: Using (1) and (2) find the transform  $\mathcal{L}\{t \cos \omega t\}$ .

Opgave 15: Application of Theorem 3. Find  $f(t)$  if  $\mathcal{L}\{f(t)\} = \frac{3}{s^2 + s}$ .

Initial value problems. Using Laplace transforms, solve:

Opgave 27:  $y'' + 4y = 0$ ,  $y(0) = 2$ ,  $y'(0) = -8$ .

Opgave 29:  $y'' + \omega^2 y = 0$ ,  $y(0) = A$ ,  $y'(0) = B$ , ( $\omega$  real, not zero).

Opgave 31:  $y'' + 5y' + 6y = 0$ ,  $y(0) = 0$ ,  $y'(0) = 1$ .