Formule za drugi kolokvij iz Analize IIb

$f(t)$	$\mathcal{L}(f)(z)$
1	$\dfrac{1}{z}$
t^n	$\dfrac{n!}{z^{n+1}}$
e^{at}	$\dfrac{1}{z-a}$
$\sin(at)$	$\dfrac{a}{z^2+a^2}$
$\cos(at)$	$\dfrac{z}{z^2+a^2}$
$t\sin(at)$	$\dfrac{2az}{(z^2+a^2)^2}$
$t\cos(at)$	$\dfrac{z^2-a^2}{(z^2+a^2)^2}$
$\mathrm{sh}(at)$	$\dfrac{a}{z^2-a^2}$
$\mathrm{ch}(at)$	$\dfrac{z}{z^2-a^2}$
$\sin(at)-at\cos(at)$	$\dfrac{2a^3}{(z^2+a^2)^2}$

Definicija:

$$\mathcal{L}(f)(z) = \int_0^\infty f(t)e^{-zt}\mathrm{d}t$$

Lastnosti:

$$\mathcal{L}(\alpha f + \beta g)(z) = (\alpha\mathcal{L}(f) + \beta\mathcal{L}(g))(z)$$
$$\mathcal{L}(f(t)e^{\alpha t})(z) = \mathcal{L}(f)(z-\alpha)$$
$$\mathcal{L}(f)'(z) = -\mathcal{L}(tf(t))(z)$$
$$\mathcal{L}(f)^{(n)}(z) = (-1)^n\mathcal{L}(t^n f(t))(z)$$
$$\mathcal{L}(f')(z) = z\mathcal{L}(f)(z) - f(0)$$
$$\mathcal{L}(f^{(n)})(z) = z^n\mathcal{L}(f)(z) - \sum_{i=1}^n z^{n-i}f^{(i-1)}(0)$$

Inverz:

$$\mathcal{L}^{-1}(F)(t) = \lim_{R\to\infty}\frac{1}{2\pi i}\int_{a-iR}^{a+iR}e^{zt}F(z)\mathrm{d}z$$