

Komplex elemi függvények

Adjuk meg algebrai alakban:

1. $\sin(3 - 4i)$
2. $\operatorname{sh}(1 + i\frac{\pi}{2})$
3. $e^{1-i\arcsin\frac{1}{3}}$
4. $\ln(-5 + 5i)$
5. $(1 + i)^i$

Mo.

$$\sin(3 - 4i) = \frac{e^{i(3-4i)} - e^{-i(3-4i)}}{2i} = \frac{e^{3i+4} - e^{-3i-4}}{2i} = \frac{e^{3i}e^4 - e^{-3i}}{2i} = \dots$$

$$\ln(-5 + 5i) = \ln(5\sqrt{2}) + \ln(\frac{3}{4}\pi i) = \ln(5\sqrt{2}) + i\frac{3}{4}\pi$$

Oldjuk meg!

1. $e^{-z} + 1 = 0$
2. $\sin(zi) = 0$
3. $\sin 5^z = 1$

Mo.

$$e^{-z\pi} = -1 = e^{\pi i}$$

$$-z\pi = \pi i + 2k\pi i$$

$$e^{-z} - \frac{1}{e^z} = 0$$

...

$$e^{5z} - \frac{1}{e^{5z}} = 1$$