$\boxed{2.3}$

$$\Phi(z) := \frac{1}{2}\left[1 + \operatorname{erf}\left(\frac{z}{\sqrt{2}}\right)\right] \quad ; \operatorname{erf}(x) = \frac{2}{\sqrt{\pi}}\int_0^x e^{-\xi^2} d\xi$$

1.

$$\operatorname{erf}(-x) = \frac{2}{\sqrt{\pi}}\int_0^{-x} e^{-\xi^2} d\xi = -\frac{2}{\sqrt{\pi}}\int_0^{-x} e^{-\xi^2}(-d\xi) = -\frac{2}{\sqrt{\pi}}\int_0^{-x} e^{-(-\xi)^2} d(-\xi) =$$

$$= -\frac{2}{\sqrt{\pi}}\int_0^{x} e^{-\xi^2} d\xi = -\operatorname{erf}(x) ,$$

2.

$$\Phi(-z) = \frac{1}{2}\left[1 + \operatorname{erf}\left(\frac{-z}{\sqrt{2}}\right)\right] = \frac{1}{2}\left[1 + \operatorname{erf}\left(-\frac{z}{\sqrt{2}}\right)\right] = \frac{1}{2}\left[1 - \operatorname{erf}\left(\frac{z}{\sqrt{2}}\right)\right] =$$

$$= \frac{1}{2}\left[2 - \left(1 + \operatorname{erf}\left(\frac{z}{\sqrt{2}}\right)\right)\right] = 1 - \frac{1}{2}\left[1 + \operatorname{erf}\left(\frac{z}{\sqrt{2}}\right)\right] = 1 - \Phi(z)$$

3.

$$\Phi(z) - \Phi(-z) = \Phi(z) - [1 - \Phi(z)] \quad \Phi(z) - 1 + \Phi(z) =$$

$$= 2\Phi(z) - 1 \Leftrightarrow$$

$$\Leftrightarrow 2\Phi(z) = \Phi(z) - \Phi(-z) + 1 \Leftrightarrow$$

$$\Leftrightarrow \Phi(z) = \frac{\Phi(z) - \Phi(-z)}{2} + \frac{1}{2}$$

$\Phi(z) := \frac{1}{2}\left[1 + \operatorname{erf}\left(\frac{z}{\sqrt{2}}\right)\right]$	$\operatorname{erf}(x) = \frac{2}{\sqrt{\pi}}\int_0^x e^{-\xi^2} d\xi$
$\Phi(-z) = 1 - \Phi(z)$	$\operatorname{erf}(-x) = -\operatorname{erf}(x)$

$$\boxed{\Phi(z) - \Phi(-z) = 2\Phi(z) - 1 \Leftrightarrow \Phi(z) = \frac{\Phi(z) - \Phi(-z)}{2} + \frac{1}{2}}$$