Iz diferentne jednačine $a_n = a_{n-1} - a_{n-2}$ za $n = 2$ dobijamo $a_2 = a_1 - a_0$, tako da je $a_0 = a_1 - a_2 = 1$. Napišimo sada diferentnu jednačinu u obliku $a_{n+2} = a_{n+1} - a_n$. Ako označimo $\mathcal{Z}\{a_n\} = \mathrm{A}(z)$, tada je, prema pravilima z-transformacije,

$$\mathcal{Z}\{a_{n+1}\} = z\,\mathrm{A}(z) - z\,a_0 = z\,\mathrm{A}(z) - z$$

$$\mathcal{Z}\{a_{n+2}\} = z^2\,\mathrm{A}(z) - z^2 a_0 - z\,a_1 = z^2\,\mathrm{A}(z) - z^2 - z$$

Stoga, primjena z-transformacije na diferentnu jednačinu daje jednačinu

$$z^2\,\mathrm{A}(z) - z^2 - z = z\,\mathrm{A}(z) - z - \mathrm{A}(z)$$

što nakon sređivanja daje $(z^2 - z + 1)\,\mathrm{A}(z) = z^2$, odakle je

$$\mathrm{A}(z) = \frac{z^2}{z^2 - z + 1}$$

Sada, a_n nalazimo primjenom inverzne z-transformacije. Rastava $\mathrm{A}(z) = z\,\mathrm{P}(z)/\mathrm{Q}(z)$ daje $\mathrm{P}(z) = z$ i $\mathrm{Q}(z) = (z - z_1)(z - z_2)$, gdje je $z_1 = (1 + i\sqrt{3})/2$ i $z_2 = (1 - i\sqrt{3})/2$. Pored toga je $\mathrm{Q}_1(z) = z - z_2$ i $\mathrm{Q}_2(z) = z - z_1$. Stoga primjena formule za inverznu z-transformaciju racionalne funkcije daje:

$$a_n = \frac{z_1}{z_1 - z_2} z_1^{\,n} + \frac{z_2}{z_2 - z_1} z_2^{\,n} = \left(\frac{1}{2} - i\frac{\sqrt{3}}{6}\right)\left(\cos\frac{\pi}{3} + i\sin\frac{\pi}{3}\right)^n + \left(\frac{1}{2} + i\frac{\sqrt{3}}{6}\right)\left(\cos\frac{\pi}{3} - i\sin\frac{\pi}{3}\right)^n =$$

$$= \left(\frac{1}{2} - i\frac{\sqrt{3}}{6}\right)\left(\cos\frac{n\pi}{3} + i\sin\frac{n\pi}{3}\right) + \left(\frac{1}{2} + i\frac{\sqrt{3}}{6}\right)\left(\cos\frac{n\pi}{3} - i\sin\frac{n\pi}{3}\right) =$$

$$= \cos\frac{n\pi}{3} + i\frac{\sqrt{3}}{3}\sin\frac{n\pi}{3} = \frac{2\sqrt{3}}{3}\left(\frac{\sqrt{3}}{2}\cos\frac{n\pi}{3} + i\frac{1}{2}\sin\frac{n\pi}{3}\right) =$$

$$= \frac{2\sqrt{3}}{3}\left(\sin\frac{\pi}{3}\cos\frac{n\pi}{3} + i\cos\frac{\pi}{3}\sin\frac{n\pi}{3}\right) = \frac{2\sqrt{3}}{3}\sin\frac{(n+1)\pi}{3}$$

Konačno je:

$$a_{1000} = \frac{2\sqrt{3}}{3}\sin\frac{1001\pi}{3} = \frac{2\sqrt{3}}{3}\sin\left(-\frac{\pi}{3} + 167\cdot 2\pi\right) = -\frac{2\sqrt{3}}{3}\sin\frac{\pi}{3} = -1$$