Step-1

The relation between F_{-k} and F_k is as follows: $\boxed{F_{-k} = (-1)^{k+1} F_k}$.

Step-2

Since the difference equation of the Fibonacci series is $F_{k+2} = F_{k+1} + F_k$, we can write $F_k = F_{k+2} - F_{k+1}$. Thus, we get

$$\begin{aligned} F_0 &= F_2 - F_1 \\ &= 0 \\ F_{-1} &= F_1 - F_0 \\ &= 1 \end{aligned}$$

$$\begin{aligned} F_{-2} &= F_0 - F_{-1} \\ &= -1 \\ F_{-3} &= F_{-1} - F_{-2} \\ &= 2 \end{aligned}$$

Step-3

Thus, we can obtain the further terms of the Fibonacci series. It is as follows:

0, 1, â€“1, 2, â€“3, 5, â€“8 13, â€“21, â€“34, 55, â€“89,...

Thus, the numerical values of the terms remain the same and the terms are alternately positive and negative.

Thus, note the following:

$$\begin{aligned} F_{-1} &= F_1 \\ F_{-2} &= -F_2 \\ F_{-3} &= F_3 \\ F_{-4} &= -F_4 \end{aligned}$$

And so on!