

Generalized Fibonacci Numbers

$$G_0 = a, \quad G_1 = b, \quad G_n = r \cdot G_{n-1} + s \cdot G_{n-2}$$

for some values a, b, r, s .

Today: $a=0, b=1, r=2, s=1 \longrightarrow$ Pell Sequence

$$P_0 = a, \quad P_1 = b, \quad P_n = 2P_{n-1} + P_{n-2}$$

Pell Sequence: $0, 1, 2, 5, 12, 29, 70, \dots$

Approximations of $\sqrt{2}$

$$\frac{1}{1}, \frac{3}{2}, \frac{7}{5}, \frac{17}{12}, \frac{41}{29}, \dots \longrightarrow \sqrt{2}$$

Pell numbers