and then describe as many patterns observed as possible. You will be amazed at the results. Since

$$(\alpha^n - \beta^n)/(\alpha - \beta) = F_n, \quad \alpha^n + \beta^n = L_n ,$$

and

$$\alpha^n = (L_n + F_n\sqrt{5})/2, \quad \beta^n = (L_n - F_n\sqrt{5})/2 ,$$

for the Fibonacci sequence defined by

$$F_1 = F_2 = 1, \quad F_n = F_{n-1} + F_{n-2}$$

and the Lucas sequence defined by

$$L_1 = 1, \quad L_2 = 3, \quad L_n = L_{n-1} + L_{n-2} ,$$

the teacher can readily check the results.

If you have found interesting uses of the Fibonacci numbers in high school teaching, you are invited to send a description to the Fibonacci Quarterly.

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Continued from page 300.

SOLUTIONS TO LINEAR RECURSION RELATIONS PROBLEMS

1. $$T_{n+1} = 8T_n - 18T_{n-1} + 16T_{n-2} - 5T_{n-3}$$

2. $$T_n = -5/2 + 7 \times 2^n - (7/6)\,3^n$$

3. $$T_{n+1} = 4T_n - 2T_{n-1} - 3T_{n-2}$$

4. $$T_{n+1} = 2T_n + T_{n-1} - 3T_{n-2} + T_{n-4}$$

(5) $$T_n = 12 + \frac{1}{\sqrt{13}}\left(\frac{3 + \sqrt{13}}{2}\right)^n - \frac{1}{\sqrt{13}}\left(\frac{3 - \sqrt{13}}{2}\right)^n$$

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