Assume

$$(5+3\sqrt{5})(9+4\sqrt{5})^t = s_t + L_{6t+2}5, \qquad s_t^2 = 5L_{6t+2}^2 - 20.$$

$$(5+3\sqrt{5})(9+4\sqrt{5})^{t+1} = 9s_t + 20L_{6t+20} + \sqrt{5}(9L_{6t+2} + 4s_t)$$

$$9L_{6t+2} + 4s_t = 9L_{6t+2} + 4\sqrt{5[(\alpha^{6t+2}+\beta^{6t+2})^2 - 4]} = 9L_{6t+2} + 20F_{6t+2}$$

$$L_{6t+8} = \alpha^{6t+8} + \beta^{6t+8} = (9+4\sqrt{5})\alpha^{6t+2} + (9-4\sqrt{5})\beta^{6t+2}$$

$$= 9L_{6t+2} + 20F_{6t+2}\ .$$

(b) A second solution chain is given by the rational part (for s) and the irrational part (for n) of

$$(15+7\sqrt{5})(9+4\sqrt{5})^t, \qquad t = 0, 1, 2, \cdots.$$

The proof that the irrational part of

$$(15+7\sqrt{5})(9+4\sqrt{5})^t$$

is identical to L_{6t+4} is similar to that used in III (a).

(c) A third solution chain is given by the rational part (for s) and the irrational part (for n) of

$$(40+18\sqrt{5})(9+4\sqrt{5})^t, \qquad t = 0, 1, 2, \cdots.$$

The proof that the irrational part of

$$(40+18\sqrt{5})(9+4\sqrt{5})^t$$

is identical to L_{6t} is similar to that used in III (a).

Also solved by P. Bruckman, P. Tracy, and J. Ivie.

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[Continued from Page 368.]

$$y+1 \leqslant z < y + (x/n)$$

is a necessary condition for a solution. Thus, we see that there can be no solution for integer x, $1 \leqslant x \leqslant n$, a well known result (see [1, p. 744]). Again, if $y = n$, there is no solution for $1 \leqslant x \leqslant n$, a well known result (see [1, p. 744]). Our proof can also be used to establish the following general result.

Theorem 2. For $n \geqslant m \geqslant 2$ and integers $A \geqslant 1$, $B \geqslant 1$, the equation

$$Ax^n + By^m = Bz^m$$

has no solution whenever $Ax^{n-m+1} + Bmy \leqslant Bmz$.

REMARK. Theorem 2 gives Theorem 1 for $A = B$ and $n = m$.

REFERENCE

1. L.E. Dickson, *History of the Theory of Numbers*, Vol. 2, Diophantine Analysis, Carnegie Institute of Washington, 1919, Reprint by Chelsea, 1952.

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