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S. M. Di'ano

letter to njas

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Rec'd Sept 8 1980  
not get answer

SMD

Santo Diano  
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Dear Dr. Sloane,

In response to your request for sequences, I offer the following:  
The concept of the "height" of a polynomial arises in connection with the proof of the denumerability of the algebraic numbers. The "height" of a polynomial is defined to be the sum of the absolute values of the coefficients (integers) and the degree of the polynomial.

If  $n$  is the height of a polynomial, let  $A_n$  be the number of polynomials of height  $n$ . Then

for  $n = 1, 2, 3, 4, 5, 6, 7, 8, 9,$   
we have  $A_n = 1, 1, 4, 11, 28, 69, 168, 407, 984.$

Recursively:  $A_n = 2A_{n-1} + A_{n-2} + 2$

Generally:  $A_n = \frac{(3+2\sqrt{2})(1+\sqrt{2})^{n-2} - (3-2\sqrt{2})(1-\sqrt{2})^{n-2}}{2\sqrt{2}} - 1$

Reference: "Height" of polynomial is defined in What is Mathematics by Courant & Robbins p. 103. CR 41 103

I know that I made use of your book to come up with these formulae and I think there is a sequence in your book which is closely related to this one, but I can't recall how I did it.

Sincerely,  
S. M. Diano

Santo Diano

CENTRAL High School, Phila.