Title: Goormaghtigh's equation: small parameters

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We explicitly solve the polynomial-exponential Diophantine equation $\frac{x^m-1}{x-1} = \frac{y^n-1}{y-1}$ for various small fixed choices of the parameters (x, y, m, n), generalizing the classical work of Makowski and Schinzel. Rather than elementary arguments, our proofs utilize a wide range of techniques from the theory of Diophantine approximation, together with extensive computer computations.

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