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# Difference equations with special polynomials as solutions

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**Abstract.** In this paper, we introduce the difference equations of Bernoulli polynomials constructed using trigonometric functions and quantum numbers. Several types of difference equations have Bernoulli polynomials (QSB and QCB) as solutions and contain various properties.

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**Keywords:**  $q$ -derivative,  $q$ -SINE Bernoulli (QSB) polynomials,  $q$ -COSINE Bernoulli (QCB) polynomials,  $q$ -difference equation

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