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Zijian Diao* (diao@ohio.edu), Ohio University Eastern Campus, 45425 National Road, St Clairsville, OH 43950. *Exactness of Grover's original quantum search algorithm.*

Grover's algorithm is one of the two most significant quantum algorithms. It is well-known that when searching 1 out of 4, the original Grover's search algorithm is exact, i.e., it succeeds with certainty. It is natural to ask the inverse question: If we are not searching 1 out of 4, is Grover's algorithm definitely not exact? We will give a complete answer to this question through some rationality results of trigonometric functions. (Received September 19, 2007)