A RELATION BETWEEN SQUARE ROOT AND NATURAL NUMBER

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Abstract. discussion about a special relationship between square root and a rational number. the result is only valid in the real domain R, for any natural number N

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1 Introduction

let a and b are real numbers belongs to set of natural number. and let x is a natural number greater than one then

$$\frac{a}{b} < \sqrt{x}\,, provided \sqrt{x} < \frac{a+bx}{(a+b)} \tag{1}$$

1.1 proof of the inequality

$$let \quad c = a/b \quad and \quad x = y^2 \tag{2}$$

$$\frac{a+bx}{(a+b)} - \sqrt{x} = \frac{c+y^2}{(c+1)} - y \tag{3}$$

$$\frac{1}{(c+1)}((c+y^2) - (c+1)y) = \frac{1}{(c+1)}(y(y-c) - (y-c))$$

(4)

$$\frac{1}{(c+1)}((y-1)(y-c)) \tag{5}$$

$$nowif\frac{(a+bx)}{(a+b)} > \sqrt{x} \quad therefore, ((\sqrt{x}-1)(\sqrt{x}-\frac{a}{b})) > 0 \tag{6}$$

1.2 references

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