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Research Article

A CONCEPT TO NEGATIVE SIGN THAT APPEAR IN EVEN NEGATIVE ROOTS ($\sqrt[2]{-A}$,$\sqrt[4]{-A}$,$\sqrt[6]{-A}$,…)

***Al hasan El Sayed**
Department of Mechanical engineering, Assiut University; Egypt
**Author for Correspondence*

ABSTRACT
I want to introduce a concept to negative sign that appear in even negative roots. The application to this concept solves the polynomial that gives even negative roots. First we make the ratio between two area under two polynomial curves

$$\frac{\int_0^a f(x)dx}{\int_0^b g(x)dx} = k$$

F(x) a polynomial give even negative roots say $y = x^2 + 2$, g(x) any polynomial say, $y = ax^2$
My research proves that the sign negative under even roots is a fixed sign.

Key Words: *Complex Analysis, Complex Variable*

INTRODUCTION

The idea to my research that we take the ratio between two area under two polynomial curves. First curve give even negative roots say. $y = x^n + b$, where n even, And the second curve any polynomial curve say, $y = ax^m$

From y=x^n +b. the root is $(x = \sqrt[n]{-b})$, where n even and we have

$$\frac{\int_0^{\sqrt[n]{-b}}(x^n + b)dx}{\int_0^x (ax^m)dx} = k$$

From this ratio $\sqrt[n]{-b}$ represent the value to root and the interval x represent the interval that satisfy the ratio k between this two area .In my research I want to obtain the meaning and concepts from this ratio not to numerical study. From this ratio the value to root x is

$$x = \sqrt[n]{-b} = \frac{(n+1)}{b.n}.k.\frac{a}{(m+1)}.|x^{m+1}|_0^x$$, where n, m even.

From this equation there is a concept to negative sign in $\sqrt[n]{-b}$, n even.

The term $|x^{m+1}|_0^x$ in this equation give a concept to negative sign in $\sqrt[n]{-b}$.

We can notice the value to the root is positive if the interval x is positive and the value to the root is negative if the interval x is negative. The sign negative in $\sqrt[n]{-b}$, n even is a fixed sign. So we write $+\sqrt[2]{-2} = +(-1.41)$. Where the sign in value (-1.41) is fixed sign. We need to examine the fixed sign in a polynomial give even negative roots say.

$y = [(x]^2 + 2).(x + 1).(x + 2)$

$y = x^4 + 3x^3 + 4x^2 + 6x + 4$

Substitute by $x = +\sqrt[2]{-2} = +(-1.41)$

Y=4+3.(-2).(-1.41)+4.(-2)+6.(-1.41)+4

Y=8-8+6.(1.41)-6.(1.41)=0

We notice when we use the sign to value (-1.41) it solve the equation. This is the prove that $x = x = x = +\sqrt[2]{-2} = +(-1.41)$ and $x = -\sqrt[2]{-2} = -(-1.41)$

The ratio between two areas under two polynomial curves where first curve give even negative roots say. $y = x^n + b$, n even and the second any polynomial curve say ($y = ax^m$). in this research m even

$$\frac{\int_0^{\sqrt[n]{-b}} (x^n + b)dx}{\int_0^x (ax^m)dx} = k$$

$$\frac{\left| \frac{1}{n+1} . x^{n+1} + bx \right|_0^{\sqrt[n]{-b}}}{a . \frac{1}{m+1} . |x^{m+1}|_0^x} = k$$

Put $x^n = b$

$$x = \sqrt[n]{-b} = \frac{(n+1)}{b.n} . k . \frac{a}{(m+1)} . |x^{m+1}|_0^x \quad \rightarrow 1$$

From this equation there is a concept to negative sign in $\sqrt[n]{-b}$, where n even. The term $|x^{m+1}|_0^x$, in equation (1) determine the sign to value $\sqrt[n]{-b}$. Where the sign to this value is positive if the interval x is positive .And the sign to this value is negative if the interval x is negative. The meaning to this notice the sign negative in $\sqrt[n]{-b}$, n even. Is a fixed sign. Also the exponent in $|x^{m+1}|_0^x$ determine the sign to the root because the location to the area. The value to the root in term of the area.

For example the curve ($y = ax^3$) give positive values to roots in (+x)axis or (-x)axis.

For equation ($y = x^2 + 2$) the interval $[2,0[$ on $+y$ axis give negative roots.

Omitt the sign negative from this negative roots and sketch this values we notice an inverse curve. The sign negative in even negative roots is to this inverse curve. The sign negative under even negative roots express only about this inverse curve not to (+x) axis or (-x) axis. We write $x = +\sqrt[2]{-2} = +(-1.41)$ and $(-1.41)^2 = (-2)$. The sign negative in $(-x^2)$ is to distinguish the value so after taking the root we keep the sign negative.

Example.

$$y = (x^2 + 2).(x + 1).(x + 2)$$

$$y = x^4 + 3x^3 + 4x^2 + 6x + 4$$

Substitute by $x = +\sqrt[2]{-2} = +(-1.41)$

Y=4+3.(-2).(-1.41)+4.(-2)+6.(-1.41)+4

Y=8-8+6.(1.41)-6.(1.41)=0

We notice when we use the sign to the value (-1.41) it solve the equation. This is the prove that $x = +\sqrt[2]{-2} = +(-1.41)$

The sign negative is to inverse curve and only to distinguish the value.

We must notice $x = -\sqrt[2]{-2} = -(-1.41)$, not equal to (+1.41) we must substitute by sign negative in the equation

For equation $y = x^2 + 2$

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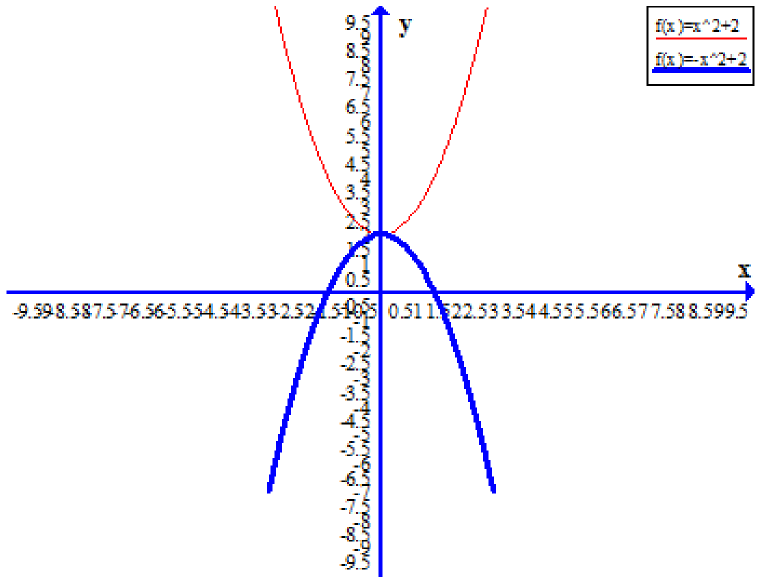

Figure 1: Two motion on +x axis

From the figure 1 there is two part on (+y) axis.
1-The interval $]+y,2]$ on +y axis give motion on (+x) axis in the direction +x→0.
2-The interval $[2,0[$ on +y axis give motion on (+x) axis in the direction 0→+x. The second motion on the inverse curve. The equation ($y = x^2 + 2$) must distinguish between this two motion on the same axis so it put the sign negative to inverse curve.
For high degree polynomial say
$y = (x^8 + 2).(x^3 + 1).(x^2 - 1)$
We must consider the sign negative to inverse curves in degree $(x^7, x^6, x^5, \ldots)$
Example
$y = [(x]^8 + 2).(x^3 + 1).(x^2 - 1)$
$y = x^{13} - x^{11} + x^{10} - x^8 + 2x^5 - 2x^3 + 2x^2 - 2$
Substitute by
$x = +\sqrt[8]{-2} = +(-1.09)$
x^2 =+(-1.18)
x^3 =+(-1.29)
x^5 =+(-1.54)
$y = x^8.x^5 - x^8.x^3 + x^8.x^2 - x^8 + 2x^5 - 2x^3 + 2x^2 - 2$
Y=(-2).(-1.54)-(-2).(-1.29)+(-2).(-1.18)-(-2)+2.(-1.54)-2.(-1.29)+2.(-1.18)-2
Y=2.(1.54)-2.(1.54)-2.(1.29)+2.(1.29)+2.(1.18)-2.(1.18)+2-2=0

RESULTS

This research proves that the sign negative under even negative roots is a concept
It represents the inverse curve.

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