If we try to solve an equation having imaginary roots, the possibilities are,

1. At the starting, or after few steps, we can't proceed further.

or

2. We may get one or more real roots in the equation, after that we can't proceed further.

<u>Example 1</u>.

$X^2+2X+101=0$

The smallest op-root (rs) is between **50.5** and **101** (including this number), **as per theorem 1.**

[Here itself ,it violates with other basic rule .Any op-root in this equation must not be more than 2. Assume we don't know this basic fact, we proceed further, by blindly following my method.]

<u>In graph(Op-roots Scale)</u>

```
50.5               63.125                  75.75                 88.375               101
|------------------|-----------------------|----------------------|---------------------|
0                  ¼                       ½                      ¾                     1
```

The method used, here is <u>'From top to bottom value approach method'.</u>

Diminish the op-roots by ¾ of the value = 88.375(round it of to the nearest whole number = 88).

$$\begin{array}{r|rrr} \mathbf{88} & 1 & 2 & 101 \\ \times & 0 & 88 & \\ \hline & 1 & -86 & \end{array}$$

Don’t proceed further .Since minus sign appeared. Mark × sign to identify it as cancelled.

Diminish the op-roots by ½ of the value = 75.75(round it off to 76.)

$$\begin{array}{r|rrr} \mathbf{76} & 1 & 2 & 101 \\ \times & 0 & 76 & \\ \hline & 1 & -74 & \end{array}$$

Don’t proceed further. Since minus sign appeared.

Diminish the op-root by ¼ of the value = 63.125(round it off to 63.)

$$\begin{array}{r|rrr} \mathbf{63} & 1 & 2 & 101 \\ \times & 0 & 63 & \\ \hline & 1 & -61 & \end{array}$$

Don’t proceed further. Since minus sign appeared.

Diminish the op-root by the starting value = 50.5(round it off to 50.)

$$\begin{array}{r|rrr} \mathbf{50} & 1 & 2 & 101 \\ \times & 0 & 50 & \\ \hline & 1 & -48 & \end{array}$$

The smallest op-root must be more than 50.But the equation disobey the my rule (theorem 1). So we can’t go further.

Example 2.

$$X^3 + 3X^2 + 5X + 3 = 0$$

The smallest op-root ‘rs’ is between .6 and 1.8(including this number), **as per theorem 1.**

The whole number between them is 1.

Diminish the op-roots of the equation by 1.

1	1	3	5	3
	0	1	2	3
	1	2	3	0
	0	1	1	
	1	1	2	
	0	1		
	1	0		

The op-root r_1 is **1**

(the op-root r_1 = 1, means the root is –1.)

The new equation is

$$X^2+2=0$$

It is obvious this equation has imaginary roots.

Suppose we try to solve this equation, at the very beginning we can’t go further.

The smallest op-root ‘rs’ is $> \frac{2}{0} = \infty$ as per theorem 1.

So we can’t go further.