**If we know the zeros of a polynomial function, we can use them to work "\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_" to find the polynomial function they came from.**

**Steps:**

**1.) Set each root = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**2.) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the equation so that it equals zero.**

**\*If your root contains an "i," you need to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ both sides of the equation first\***

**3.) Take the factors and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ together.**

**4.) Write in \_\_\_\_\_\_\_\_\_\_\_\_\_ form set = \_\_\_\_\_\_\_\_.**

**Example: Write a polynomial function, in standard form, that has the given zeros.**

|  |  |
| --- | --- |
| **- 3, 5** | **3i** |

**Special Cases:**

**When given a zero that is a complex number (\_\_\_\_\_\_) we must work "backwards" a little differently. Remember the complex numbers also come in a pairs (\_\_\_\_\_\_\_\_\_)!**

**Steps:**

**1.) In one brackets, write**

[x - (\_\_\_\_\_\_\_\_\_)] [x - (\_\_\_\_\_\_\_\_)]

**2.) Since the brackets contain both real & imaginary numbers, we need to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ all of the real numbers together.**

[(\_\_\_\_\_\_\_\_\_\_) + bi] [(\_\_\_\_\_\_\_\_\_) - bi]

**3.) Multiply the \_\_\_\_\_\_\_\_\_\_\_ terms in each bracket. Then multiply the \_\_\_\_\_\_\_\_\_\_ terms in each bracket.**

[(\_\_\_\_\_\_\_)2 - (\_\_\_\_\_\_\_)2]

**4.) Simplify, combine like-terms, and write your answer in standard form = f(x).**

**Example: Write a polynomial function, in standard form, that has the given zeros.**

**2 – 3i**