Math 3 **4.9 Writing Polynomial Equations** Unit 4

*EQ: How do you write polynomial equations with given real and complex roots?*

|  |  |  |
| --- | --- | --- |
| Roots | as | Factors |
| x = a | 🡪 | (x - a)=0 |

When solving a polynomial function, oftentimes we can factor and set our factors equal to zero in order to solve. When writing a polynomial function, work this process backwards.

**Solving Polynomial Equations:**

Solve 5x2 + 8x + 3 = 0 by factoring.

**Writing Polynomial Equations:**

Write a polynomial function with roots at -1 and -3/5.

**Example 1:** Write the polynomial function with roots at 0, 

**Example 2:** Write the polynomial function with roots at , , and 

**Example 3:** Write a polynomial function with roots at 5 and ±3i.

**You Try!** Write a cubic function with zeros at -7 and ±2i.

**Example 4:** Write a cubic equation with roots at and 

**You Try!** Write a cubic equation with roots at and 

|  |  |  |
| --- | --- | --- |
| 5. | Function: | Graph: |
| **End Behavior:**    **Roots (with Multiplicity):**  (3, 0) m:1  (-1, 0) m:2  (0, 0) m:2  **Value of the leading coefficient:** -1  **Domain: Range:** | |

|  |  |  |
| --- | --- | --- |
| 6. | Function: | Graph: |
| **End Behavior:**    **Roots (with Multiplicity):**  **Value of the leading coefficient:** 1  **Domain: Range:** | |