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

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

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| --- | --- | --- |
| 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 $\sqrt{2}$, $-\sqrt{2}$, 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:** |

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