Algebra 2 w/ Trig

2.7 Apply the Fundamental Theorem of Algebra

Warm-Up:

**1.** **What is the degree of** *f (x) =* 8*x*6 *–* 4*x*5 + 3*x*2 + 2**?**  **2.** **Solve** *x*2 *–* 2*x* + 3 = 0

**3. The function** *P* **given by** *x*4+3*x*3 *–* 30*x*2 *–* 6*x =* 56 **model the profit of a company. What are the real solution of the function?**

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Example 1: Find the number of solutions of zeros

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Example 1: Find the Number of Solutions or Zeros

**a. How many solutions does the equation**

*x*3 + 5*x*2 + 4*x* + 20 = 0 **have?**

YOU TRY:

**1. How many solutions does the equation**

*x*4 + 5*x*2 – 36 = 0 **have?**

**b. How many zeros does the function**

*f* (*x*) = *x*4 – 8*x*3 + 18*x*2 – 27 **have?**

**2. How many zeros does the function**

*f* (*x*) = *x*3 + 7*x*2 + 8*x* – 16 **have?**

Example 2: Find the zeros of the Polynomial Function YOU TRY:

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| **Find all zeros of** *f* (*x*) = *x*5 – 4*x*4 + 4*x*3 + 10*x*2 – 13*x* – 14. | **3. Find all the zeros of** *f* (*x*) = *x*3 + 7*x*2 + 15*x* + 9 |

Example 3: Use Zeros to Write a Polynomial Function

**Write a polynomial function** *f* **of least degree that has rational coefficients, a leading coefficient of** 1**, and** 3 **and**

$2\pm \sqrt{5} $**as zeros.**

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| 4. $4, 1\pm \sqrt{5}$ | 5. $2,\pm 2i, 4\pm \sqrt{6}$ |

YOU TRY: Write a polynomial function *f* of least degree that has rational coefficients, a leading coefficient of 1, and the given zeros.

Example 4: Approximate Real Zeros of a Polynomial Model

**A tachometer measures the speed (in revolutions per minute, or *RPMs*) at which an engine shaft rotates. For a certain boat, the speed *x* of the engine shaft (in 100*s* of *RPMs*) and the speed *s* of the boat (in miles per hour) are modeled by**

***s* (*x*) = 0.00547*x*3 – 0.225*x*2 + 3.62*x* – 11.0**

**What is the tachometer reading when the boat travels 15 miles per hour?**

YOU TRY:

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| **6. Approximate the real zeros of***f* (*x*) = 3*x*5 + 2*x*4 – 8*x*3 + 4*x*2 – *x* – 1**.** | **7. The profit *P* for printing envelopes is modeled**  **by *P* = *x* – 0.001*x*3 – 0.06*x*2 + 30.5*x*, where *x* is**  **the number of envelopes printed in thousands.**  **What is the least number of envelopes that**  **can be printed for a profit of $1500?** |

Hw: Section 2.7 p. 141 #3-9, 10-13, 20-25, 42-49

KEEP GOING:

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| 1. **Find all the zeros of**  *f(x)* = *x*4 – *x*2 – 20.
 | **2. Write a polynomial function of least degree**  **that has rational coefficients, a leading**  **coefficient of** 1**, and** – 3 **and** 1 – 7*i* |