

Name:	Date:
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Topic:	Class:
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Main Ideas/Questions	Notes/Examples
WARM-UP	1. Consider the polynomial function $f(x) = x^3 + x^2 - 4x + 4$.
	a) Divide the function by $(x + 4)$.
	b) Find $f(-4)$
	2. Consider the polynomial function $f(x) = 7x^4 - 63x^3 + 9x - 80$.
	a) Divide the function by $(x - 9)$.
	b) Find $f(9)$
REMAINDER THEOREM	<ul style="list-style-type: none"> • Remainder Theorem: If a polynomial function $f(x)$ is divided by _____, then the _____ is _____. • Using synthetic division to evaluate a function is called _____.
EXAMPLES	<p>Use The Remainder Theorem (Synthetic Substitution) to evaluate $f(x)$ at c.</p> <p>3. $f(x) = x^4 + 8x^3 + 12x^2 - 7x - 14$; $c = -3$</p>
APPLICATIONS	<p>4. The number of tickets sold during the Oakdale High School football season can be modeled by the equation $f(x) = x^3 - 14x^2 + 45x + 68$, where x is the number of games played. Use the Remainder Theorem to find the number of tickets sold during the seventh game of the season.</p>

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FACTOR THEOREM	
TEST FOR FACTORS	<p>Directions: Use the Factor Theorem to determine which binomials are factors of the given function. Check all that apply.</p> <p>1. $f(x) = x^3 - 31x + 30$</p> <p><input type="checkbox"/> $(x + 1)$</p> <p><input type="checkbox"/> $(x - 5)$</p> <p><input type="checkbox"/> $(x + 6)$</p> <p>2. $f(x) = x^5 - 6x^4 - 17x^3 + 78x^2 - 56x$</p> <p><input type="checkbox"/> $(x - 2)$</p> <p><input type="checkbox"/> $(x + 7)$</p> <p><input type="checkbox"/> $(x + 4)$</p>
FACTORING & FINDING ZEROS	<p>Directions: Use the Factor Theorem and the given binomial to completely factor the polynomial function. Then, give the zeros.</p> <p>3. $f(x) = x^3 + 3x^2 - 4x - 12$; $(x + 3)$</p>

4. $f(x) = x^3 - 2x^2 - 19x + 20; (x - 5)$

5. $f(x) = 2x^3 - 7x^2 - 53x + 28; (x - 7)$

6. $f(x) = 9x^4 - 18x^3 - 73x^2 + 2x + 8; (x + 2)$

7. $f(x) = 3x^4 + 5x^3 - 42x^2 + 40x; (x + 5)$

8. $f(x) = 4x^5 - 12x^4 - 13x^3 + 39x^2 + 9x - 27; (x - 3)$