RATIONALIZING THE DENOMINATOR

DAY 2

Textbook Chapter 4.5

To rationalize a **Single-Term Denominator** – Multiply both numerator and denominator by the *radical* in the denominator.

1. $\frac{3}{\sqrt{2}}$

2. $\frac{5}{4\sqrt{3}}$

To rationalize a denominator with **Two Terms** – Multiply both numerator and denominator by a *conjugate*.

3. $\frac{2}{3-\sqrt{7}}$

4. $\frac{3}{2\sqrt{3}+5}$

To rationalize an **Nth Root Denominator** – Multiply by the base raised to the power of the index minus the exponent.

5. $\frac{1}{\sqrt[3]{5}}$

6. $\frac{7}{\sqrt[3]{5^2}}$

Evaluate the expression using a calculator. Round the result to two decimal places.

26. $\sqrt[4]{49}$

27. $\sqrt[9]{19{,}422}$

28. $\sqrt[5]{-122}$

29. $(215)^{1/5}$

30. $(-15)^{1/3}$

31. $(116)^{1/6}$

Negative? Positive? Imaginary? What?

Warm-Up. Simplify.

1. $\sqrt{50}$ = _____	2. $\sqrt{-50}$ = _____
3. $50^{1/2}$ = _____	4. $50^{-1/2}$ = _____

NEW NOTES: Nth Roots of Negative Numbers

If there is a negative in an _____ root, then the answer is _____.	If there is a negative in an _____ root, then the answer is _____.
5. $\sqrt{-100}$ = _____	6. $\sqrt[3]{-8}$ = _____
7. $\sqrt{144}$ = _____	8. $\sqrt[3]{-27}$ = _____
9. $\sqrt{-25}$ = _____	10. $\sqrt[3]{64}$ = _____
11. $\sqrt{-16}$ = _____	12. $\sqrt[5]{-32}$ = _____
13. $\sqrt{-81}$ = _____	14. $\sqrt[3]{-125}$ = _____

Solving Equations using the nth Roots

What values of x do you think will make these equations true?

a) $x^2 = 81$ b) $x^3 = 27$ c) $x^3 = -125$ d) $x^2 = -16$

Important Facts to remember when solving equations using nth Roots:

- Isolate the exponent first!
- **Even** Roots: $\pm\sqrt[x]{\ }$ **Odd** Roots: *use the sign*
- You only need to use the imaginary # i when you are taking the SQUARE root of a NEGATIVE #
- *CHECK all solutions!!!*

1. $x^2 = 49$	2. $2x^2 = 50$
3. $(x + 3)^2 = 64$	4. $3(x - 5)^2 = -27$

5. $2x^4 - 10 = 152$	6. $(x - 2)^3 = -125$
7. $6x^3 = 384$	8. $(x - 3)^4 + 7 = 632$
9. $\frac{1}{4}x^3 = -2$	10. $2(x - 8)^2 - 8 = -108$
11. $(x + 1)^5 = 100$	12. $\frac{3}{2}x^4 = 48$