Warm-Up:

1) Find f^{-1}.

$f(x) = (x + 2)^2$

$\pm\sqrt{x} = \sqrt{(y+2)^2}$

$\pm\sqrt{x} = y + 2$

$-2 \quad -2$

$y = \pm\sqrt{x} - 2$

$f^{-1}(x) = \pm\sqrt{x} - 2$

2) Find $\sqrt{297}$

$\sqrt{9}\sqrt{33}$

$3\sqrt{33}$

28, 26, 24

24) $f(x) = \frac{1}{3}x + 4$

$x = \frac{1}{3}y + 4$

$3(x-4) = 3\left(\frac{1}{3}y\right)$

$3x - 12 = y$

26) $g(x) = \frac{2x+3}{6}$

$6(x) = \left(\frac{2y+3}{6}\right)6$

$6x = 2y + 3$

$\frac{6x-3}{2} = \frac{2y}{2}$

$\frac{6x-3}{2} = y$

28) $A = \pi r^2$

$\frac{r}{\pi} = \frac{\pi A^2}{\pi}$

$\sqrt{\frac{r}{\pi}} = \sqrt{A^2}$

$A = \sqrt{\frac{r}{\pi}}$

Section 7-4: *n*th Roots

The opposite of anything to the *n*th power is the *n*th root of that number.

The opposite of 7^2 is $\sqrt{7^2}$.

$\sqrt[n]{b}$ is read as "the *n*th root of *b*"

When more than one root is possible, the nonnegative root is the principal root.

(-9)^3

For $\sqrt[n]{b}$, if *n* is even, then there are 2 possible roots.

One root is negative the other is positive.

For $\sqrt[n]{b}$, if *n* is odd, then there are 1 possible roots.

The root is odd or even, depending on the sign.

Examples:
Simplify.

1) $\pm\sqrt{16x^8}$ $= \pm 4x^4$

2) $-\sqrt{(q^3+5)^4}$ $= -(q^3+5)^2$

3) $\sqrt[5]{243a^{10}b^{15}}$ $= 3a^2b^3$

4) $\sqrt{-4}$ No Real Root

Examples:
Simplify.

5) $\sqrt[6]{t^6}$ $|t|$

If the nth root is even and when simplified results in an odd exponent, absolute values are required.

$\sqrt{(-100)^2} = 100$

6) $\sqrt[5]{1024(x+2)^{15}}$ $= 4(x+2)^3$

Examples:

7) The relationship between the length and mass of Pacific halibut can be approximated by the equation $L = 0.46\sqrt[3]{M}$, where L is the length of the fish and M is the mass in kilograms. Use a calculator to approximate the length of a 30-kilogram Pacific halibut.

$L = 0.46\sqrt[3]{M}$

$L = 0.46\sqrt[3]{30}$

$L = 0.46(3.11)$

$L = 1.43 \text{ m}$

Homework: pg. 405-406 #14-36 even, 44, 50, 56

Quiz 7-1, 7-2, 7-3 Next Class