Algebra 2 6.4

Simplify radicals

Use a calculator to approximate roots

inverse operation

index

radical sign

radicand

principal root

* simplify vs. evaluate

whiteboards

72

36 2

6 6

$\sqrt{72} = 8.49$

$\sqrt{72} = 6\sqrt{2}$

Whiteboards

Simplify.

12. $\pm\sqrt[2]{121x^4y^{16}}$

$\pm 11x^2y^8$

13 $\pm\sqrt[2]{225a^{16}b^{36}}$

$\pm 15a^8b^{18}$

$\sqrt{49} = 7$

21. $\sqrt[3]{8a^6b^{12}}$

22. $\sqrt[6]{d^{24}x^{36}}$

4 2

2 2

$2a^2b^4$

64

4 16

4 4

$\sqrt[3]{64r^2}$

$4\sqrt[3]{r^2}$

$4\sqrt[3]{r^2}$

30. 5 $\sqrt[4]{81(x+4)^4}$ **31.** $\sqrt[3]{(4x-7)^{24}}$

$5 \cdot 3(x+4)$

$15(x+4)$

81

9 9

3 3 3 3

GuidedPractice

3A. The surface area of a sphere can be determined from the volume of the sphere using the formula $\boxed{S = \sqrt[3]{36\pi V^2}}$, where V is the volume. Determine the surface area of a sphere with a volume of 200 cubic inches.

$$\underset{\text{surf area}}{S} = \sqrt[3]{36\pi \underset{\text{vol}}{V}^2} = \sqrt[3]{(36\pi\, 200^2)}$$

$$\sqrt[3]{4523893.421}$$

$$165.4\ \text{in}^2 \quad \wedge\left(\frac{1}{3}\right)$$

$S = \sqrt[3]{36\pi V^2}$

3B. If the surface area of a sphere is about 214.5 square inches, determine the volume.

$(214.5)^3 = \left(\sqrt[3]{36\pi V^2}\right)^3$

$\frac{9869198.625}{36\pi} = \frac{36\pi V^2}{36\pi}$

$87262.87 = V^2$

$295.9 \text{ in}^3 = V$