Algebra II Academic

Key

Name_____

Study Guide - Lesson 8.6

Simplify.

1) $\sqrt[5]{128}$

$2\sqrt[5]{4}$

2) $\sqrt[3]{64}$

4

3) $\sqrt[3]{625}$

$5\sqrt[3]{5}$

4) $\sqrt[3]{-384}$

$-4\sqrt[3]{6}$

5) $\sqrt[3]{216}$

6

6) $\sqrt{343}$

$7\sqrt{7}$

7) $\sqrt[6]{192n^8}$

$2n\sqrt[6]{3n^2}$

8) $\sqrt{256xy^4}$

$16y^2\sqrt{x}$

9) $\sqrt[3]{189m^3}$

$3m\sqrt[3]{7}$

10) $\sqrt[4]{567a^2b^4}$

$3b\sqrt[4]{7a^2}$

11) $\sqrt{288n^3}$

$12n\sqrt{2n}$

12) $\sqrt[5]{256x^5y^4z^3}$

$2x\sqrt[5]{8y^4z^3}$

Write each expression in radical form.

13) $(10n)^{\frac{7}{4}}$

$(\sqrt[4]{10n})^7$

14) $x^{\frac{5}{6}}$

$(\sqrt[6]{x})^5$

15) $v^{\frac{3}{2}}$

$(\sqrt{v})^3$

16) $(3x)^{\frac{5}{2}}$

$(\sqrt{3x})^5$

17) $(6a)^{-\frac{1}{3}}$

$\frac{1}{\sqrt[3]{6a}}$

18) $(4k^2)^{\frac{1}{3}}$

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

Write each expression in exponential form.

19) $(\sqrt{7x})^5$

$(7x)^{5/2}$

20) $\frac{1}{(\sqrt[6]{10p})^5}$

$(10p)^{-5/6}$

21) $(\sqrt[3]{n})^2$

$n^{2/3}$

22) $\sqrt[3]{7r}$

$(7r)^{1/3}$

23) $(\sqrt{6m})^3$

$(6m)^{3/2}$

24) $\frac{1}{(\sqrt[3]{6x})^2}$

$(6x)^{-2/3}$

Simplify.

25) $(r^8)^{-\frac{3}{4}} = \frac{1}{(\sqrt[4]{r^8})^3} = \frac{1}{(r^2)^3} =$ $\boxed{\frac{1}{r^6}}$

26) $(216x^9)^{\frac{4}{3}} = (\sqrt[3]{216x^9})^4 = (6x^3)^4$ $\boxed{1296x^{12}}$

27) $(25x^4)^{-\frac{1}{2}} = \frac{1}{\sqrt{25x^4}}$ $\boxed{\frac{1}{5x^2}}$

28) $(64b^6)^{-\frac{3}{2}} = (\sqrt{64b^6})^3 = \frac{1}{(8b^3)^3}$ $\boxed{\frac{1}{512b^9}}$

29) $(81n^4)^{\frac{3}{2}}$ $\boxed{729n^6}$ $\rightarrow (\sqrt{81n^4})^3 = (9n^2)^3$

30) $(32a^{10})^{\frac{4}{5}} \rightarrow (\sqrt[5]{32a^{10}})^4 = (2a^2)^4 =$ $\boxed{16a^8}$

Directions: Find all real roots.

31. Fourth roots of -1296

No real roots

32. Cube roots of 216

6

Directions: Simplify each expression.

33. $\sqrt[3]{\frac{x^3}{7}}$

$\frac{\sqrt[3]{x^3}}{\sqrt[3]{7}} \cdot \frac{\sqrt[3]{7}}{\sqrt[3]{7}} \cdot \frac{\sqrt[3]{7}}{\sqrt[3]{7}} = \frac{\sqrt[3]{49x^3}}{\sqrt[3]{343}} = \boxed{\frac{x\sqrt[3]{49}}{7}}$

34. $\sqrt[4]{\frac{16x^8}{5}}$

$\frac{\sqrt[4]{16x^8}}{\sqrt[4]{5}} = \frac{2x^2}{\sqrt[4]{5}} \cdot \frac{\sqrt[4]{5}}{\sqrt[4]{5}} \cdot \frac{\sqrt[4]{5} \cdot \sqrt[4]{5}}{\sqrt[4]{5} \sqrt[4]{5}} = \frac{2x^2\sqrt[4]{125}}{\sqrt[4]{625}} = \boxed{\frac{2x^2\sqrt[4]{125}}{5}}$

35. $\sqrt[3]{x^3} \cdot \sqrt[3]{x^{12}}$

$\sqrt[3]{x^{15}} = \boxed{x^5}$

36. $13^{\frac{1}{2}} \cdot 13^{\frac{3}{2}}$

$13^{1/2 + 3/2} = 13^2 = \boxed{169}$

37. $\frac{125^{\frac{2}{3}}}{125^{\frac{1}{3}}}$ $125^{\frac{2}{3} - \frac{1}{3}} = 125^{1/3}$

$= \sqrt[3]{125}$

$= \boxed{5}$

38. $7^{\frac{1}{4}} \cdot 7^{-\frac{3}{4}}$ $7^{1/4 - 3/4} = 7^{-2/4} = 7^{-1/2}$

$\boxed{\frac{1}{7^{1/2}} \text{ or } \frac{\sqrt{7}}{7}}$