Name Key Date

LESSON 6.2 **Practice**
For use with pages 420–427

★only do circled problems

Simplify the expression using the properties of radicals and rational exponents.

1. $64^{2/3} =$

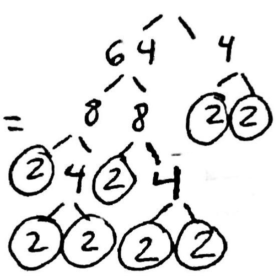
$(64^{1/3})^2 = 4^2 = \boxed{16}$

2. $8^{-3/4} = \frac{1}{8^{3/4}}$

$\frac{1}{8^{3/4}} \cdot \frac{8^{1/4}}{8^{1/4}} = \frac{8^{1/4}}{8^{4/4}} = \boxed{\frac{8^{1/4}}{8}}$

3. $\sqrt[6]{256} =$

$256 = 2^8$



$\sqrt[6]{2^8} = \sqrt[6]{2^6 \cdot 2^2} = 2\sqrt[6]{2^2} = \boxed{2\sqrt[6]{4}}$

4. $5^{1/4} \cdot 3^{1/4}$

5. $\sqrt[4]{2} \cdot \sqrt[4]{8}$

6. $\frac{\sqrt[4]{192}}{\sqrt[4]{6}}$

$\sqrt[3]{54} =$

$\sqrt[3]{27}\,\sqrt[3]{2}$

$3\sqrt[3]{2}$

7. $\frac{11}{\sqrt[4]{11}}$

8. $\sqrt[3]{7} \cdot \sqrt[3]{49} =$

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

9. $(3^{3/2})^2$

10. $\left(\frac{54}{64}\right)^{1/3} = \frac{54^{1/3}}{64^{1/3}} =$

$\frac{54^{1/3}}{4} = \frac{3\sqrt[3]{2}}{4} = \boxed{\frac{3(2)^{1/3}}{4}}$

11. $\frac{\sqrt[4]{32}}{\sqrt[4]{2}} = \sqrt[4]{\frac{32}{2}} =$

$\sqrt[4]{16} = \boxed{2}$

12. $\frac{\sqrt[5]{5}}{\sqrt[5]{27}} \cdot \frac{\sqrt[5]{9}}{\sqrt[5]{9}} = \frac{\sqrt[5]{45}}{\sqrt[5]{243}} = \boxed{\frac{\sqrt[5]{45}}{3}}$

Simplify the expression. Assume all variables are positive.

13. $x^{5/3} \cdot x^{4/3}$

14. $\sqrt[5]{x^{2/5}}$

15. $(x^{1/2})^{2/7}$

16. $\left(\frac{x^2}{27}\right)^{1/3} = \frac{x^{2/3}}{27^{1/3}} = \boxed{\frac{x^{2/3}}{3}}$

17. $\sqrt[3]{16x^4}$

18. $(x^{-3})^{2/5}$

19. $\frac{x^{7/5}}{x^{4/5}}$

20. $\frac{\sqrt[3]{64x^3y}}{4x^{-3}y} = \frac{4x\sqrt[3]{y}}{4x^{-3}y} =$

$\sqrt[3]{64x^3y} =$

$4x\sqrt[3]{y}$

$\frac{4}{4} = 1$

$x^{1-(-3)} =$

$x^{1+3} = x^4$

$\boxed{\frac{x^4\sqrt[3]{y}}{y}}$

can leave because radical is in numerator

21. $x^5 \cdot x\sqrt{3}$

22. $(x^{\sqrt{2}})^{3\sqrt{2}}$

23. $\frac{x^{4\sqrt{3}}}{2x^{2\sqrt{3}}}$

24. $(\sqrt[3]{x^4} \cdot \sqrt{x^5})^{-2} =$

$(x^{4/3} \cdot x^{5/2})^{-2} =$

$\left(\frac{2}{2}\right)\frac{4}{3} + \frac{5}{2}\left(\frac{3}{3}\right) =$

$\frac{8}{6} + \frac{15}{6} = \frac{23}{6}$

$(x^{23/6})^{-2} = x^{-46/6} =$

$x^{-23/3} = \frac{1}{x^{23/3}} = \frac{1}{x^7 x^{2/3}} \cdot \frac{x^{1/3}}{x^{1/3}} =$

$\frac{x^{1/3}}{x^7 \cdot x^{3/3}} = \frac{x^{1/3}}{x^7 \cdot x} = \boxed{\frac{x^{1/3}}{x^8}}$

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LESSON 6.2

Practice *continued*

For use with pages 420–427

Perform the indicated operation. Assume all variables are positive.

$\sqrt{27} = \sqrt{9}\,\sqrt{3} = 3\sqrt{3}$

$\sqrt{48} = \sqrt{16}\,\sqrt{3} = 4\sqrt{3}$

25. $6\sqrt[3]{5} + 2\sqrt[3]{5}$

26. $5\sqrt{5} - \sqrt{45}$

27. $2\sqrt{27} - 3\sqrt{48}$

$2(3\sqrt{3}) - 3(4\sqrt{3}) =$

$6\sqrt{3} - 12\sqrt{3} = \boxed{-6\sqrt{3}}$

28. $2\sqrt{x} + 7\sqrt{x}$

29. $3(x^{1/2}y^3)^2 - (x^3y^{18})^{1/3}$

$3(x^{2/2}y^6) - x^{3/3}y^{18/3} = 3xy^6 - xy^6 = \boxed{2xy^6}$

30. $4x^{\sqrt{3}} + x^{\sqrt{3}}$

Write the expression in simplest form. Assume all variables are positive.

31. $\sqrt[4]{3x^7y^9z^3} =$

$\sqrt[4]{3x^4x^3y^4y^4yz^3} =$

$x \cdot y \cdot y\sqrt[4]{3x^3yz^3} = \boxed{xy^2\sqrt[4]{3x^3yz^3}}$

32. $\sqrt{x^3y^4z} \cdot \sqrt{xyz^4}$

33. $\sqrt[3]{\dfrac{81x^2}{8xy^4z}} = \sqrt[3]{\dfrac{81x}{8yz}} =$

$x^{2-1} = x$

$y^{3-4} = y^{-1} = \dfrac{1}{y}$

$\dfrac{\sqrt[3]{81x}}{\sqrt[3]{8yz}} =$

$\dfrac{\sqrt[3]{81x}}{2\sqrt[3]{yz}} \cdot \dfrac{\sqrt[3]{y^2z^2}}{\sqrt[3]{y^2z^2}} =$

$\dfrac{\sqrt[3]{81xy^2z^2}}{2\sqrt[3]{y^3z^3}} =$

$\sqrt[3]{81} = \sqrt[3]{27}\,\sqrt[3]{3} = 3\sqrt[3]{3}$

$\boxed{\dfrac{3\sqrt[3]{3xy^2z^2}}{2yz}}$

Solve for x and simplify.

34. $x^3 + 17 = 137$

$-17 \quad -17$

$\sqrt[3]{x^3} = \sqrt[3]{120}$

$x = \sqrt[3]{120}$

$\sqrt[3]{120} = \sqrt[3]{8}\,\sqrt[3]{15} = 2\sqrt[3]{15}$

$\boxed{x = 2\sqrt[3]{15}}$

35. $\dfrac{2(x-1)^4}{2} = \dfrac{162}{2}$

$\sqrt[4]{(x-1)^4} = \sqrt[4]{81}$

$x - 1 = \pm 3$

$x - 1 = 3$ & $x - 1 = -3$

$+1 \quad +1 \qquad +1 \quad +1$

$\boxed{x = 4 \ \& \ x = -2}$