AT

Name: Key

Chapter 1: 1-2 Exponents & Radicals (IC/HW)-day 2-3 Date: _____ Period: _____

Express the number in the form a/b, where a and b are integers.

1. $\frac{2^{-3}}{3^{-2}}$

$\frac{3^2}{2^3} = \frac{9}{8}$

2. $(-\frac{3}{2})^4 - 2^{-4}$

$\frac{81}{16} - \frac{1}{16}$

$= \frac{80}{16} = \frac{5}{1}$

3. $(-0.008)^{2/3}$

$\frac{1}{25}$

4. $\frac{2^0 + 0^2}{2+0}$

$\frac{1+0}{2} = \frac{1}{2}$

Simplify.

5. $(4a^{3/2})(2a^{1/2})$

$8a^2$

6. $(8r)^{1/3}(2r^{1/2})$

$2r^{\frac{1}{3}} \cdot 2r^{\frac{1}{2}}$

$4r^{\frac{5}{6}}$

7. $(8x^{-2/3})x^{1/6}$

$8x^{-\frac{3}{6}}$

$= \frac{8}{x^{\frac{1}{2}}}$

8. $\frac{(-y^{\frac{3}{2}})^3}{y^{\frac{-1}{3}}}$

$\frac{-y^{\frac{9}{2}}}{y^{-1}} = -y^{\frac{11}{2}}$

9. $\frac{(x^6y^3)^{\frac{-1}{3}}}{(x^4y^2)^{\frac{-1}{2}}}$

$\frac{x^{-2}y^{-1}}{x^{-2}y^{-1}} = 1$

10. $a^{\frac{4}{3}}a^{\frac{-3}{2}}a^{\frac{1}{6}}$

$a^{\frac{8}{6}}a^{\frac{-9}{6}}a^{\frac{1}{6}}$

$a^0 = 1$

11. $(\frac{c^{-4}}{16d^8})^{\frac{3}{4}}$

$\frac{c^{-3}}{8d^6} = \frac{1}{8c^3d^6}$

12. $(3x^{5/6})(8x^{2/3})$

$24x^{\frac{9}{6}}$

$= 24x^{\frac{3}{2}}$

Rewrite the expression using rational exponents.

13. $\sqrt[3]{x^5} = x^{\frac{5}{3}}$

14. $\sqrt{x^2 + y^2}$

$(x^2+y^2)^{\frac{1}{2}}$

15. $\sqrt{a+\sqrt{b}}$

$(a+b^{\frac{1}{2}})^{\frac{1}{2}}$

Rewrite the expression using a radical.

16. $4 + x^{3/2}$

$4 + \sqrt{x^3}$

$4 + x\sqrt{x}$

$\sqrt{x^3} = \sqrt{x^2 \cdot x} = x\sqrt{x}$

17. $(4 + x)^{3/2}$

$(4+x)\sqrt{4+x}$

18. $(4x)^{3/2}$

$(\sqrt{4x})^3 = (2\sqrt{x})^3 = 8x\sqrt{x}$

or $4x \cdot 2\sqrt{x} = 8x\sqrt{x}$

Simplify the expression, and rationalize the denominator when appropriate.

19. $\sqrt[5]{-64}$

20. $\frac{1}{\sqrt[3]{2}}$

21. $\sqrt{\frac{1}{7}}$

22. $\sqrt{9x^{-4}y^6}$

23. $\sqrt[4]{81r^5s^8}$

24. $\sqrt[3]{\frac{2x^4y^4}{9x}}$

25. $\sqrt[4]{\frac{x^7y^{12}}{125x}}$

26. $\sqrt[4]{(3x^5y^{-2})^4}$

Simplify the expression, assuming x and y may be negative.

27. $\sqrt{x^4y^{10}}$

28. $\sqrt[4]{x^8(y-1)^{12}}$

29. The length-weight relationship for Pacific halibut can be approximated by the formula $L = 0.46\sqrt[3]{W}$, where W is in kilograms and L is in meters. The largest documented halibut weighed 230 kilograms. Estimate its length.

30. The length-weight relationship for a whale can be approximated by $W = 0.0016L^{2.43}$, where W is in tons and L is in feet. Estimate the weight of a whale that is 25 feet long.