PROBLEM SET 7-4
(Rational Exponents)

Write each expression in exponential form:

1. $\sqrt{10}$ **2.** $\sqrt{7x^3}$ **3.** $\sqrt{(7x)^3}$ **4.** $(\sqrt{7x})^3$

5. $\sqrt[3]{a^2}$ **6.** $(\sqrt[3]{a})^2$ **7.** $\sqrt[4]{c^2}$ **8.** $\sqrt[3]{(5xy)^6}$

Simplify each number:

9. $8^{\frac{2}{3}}$ **10.** $64^{\frac{2}{3}}$ **11.** $(-8)^{\frac{2}{3}}$ **12.** $(-32)^{\frac{6}{5}}$

13. $(32)^{-\frac{4}{5}}$ **14.** $(-216)^{-\frac{2}{3}}$ **15.** $-(-27)^{-\frac{4}{3}}$ **16.** $\dfrac{1000^{\frac{4}{3}}}{100^{\frac{3}{2}}}$

Simplify each expression using positive exponents:

17. $\left(x^{\frac{2}{3}}\right)^{-3}$ **18.** $\left(3x^{\frac{2}{3}}\right)^{-1}$ **19.** $(-27x^{-9})^{\frac{1}{3}}$ **20.** $\left(\dfrac{x^3}{x^{-1}}\right)^{-\frac{1}{4}}$

21. $\left(x^{\frac{1}{2}}y^{-\frac{2}{3}}\right)^{-6}$ **22.** $\left(x^{\frac{2}{3}}y^{-\frac{1}{6}}\right)^{-12}$ **23.** $\left(\dfrac{x^{\frac{1}{4}}}{y^{-\frac{3}{4}}}\right)^{12}$ **24.** $\left(\dfrac{x^{-\frac{2}{3}}}{y^{-\frac{1}{3}}}\right)^{15}$

25. $x^{\frac{2}{7}} \cdot x^{\frac{3}{14}}$ **26.** $y^{\frac{1}{2}} \cdot y^{\frac{3}{10}}$ **27.** $x^{\frac{3}{5}} \div x^{\frac{1}{10}}$ **28.** $y^{\frac{5}{7}} \div y^{\frac{3}{14}}$

29. $\dfrac{x^{\frac{2}{3}}y^{-\frac{1}{4}}}{x^{\frac{1}{2}}y^{-\frac{1}{2}}}$ **30.** $\dfrac{x^{\frac{1}{2}}y^{-\frac{1}{3}}}{x^{\frac{3}{4}}y^{\frac{1}{2}}}$ **31.** $\left(\dfrac{16x^{14}}{81y^{18}}\right)^{\frac{1}{2}}$ **32.** $\left[\left(x^{-\frac{1}{2}}\right)^2\right]^{\frac{1}{3}}$