Name____ Date__________

6.2 Enrichment and Extension

Simplifying Radical Expressions

When simplifying with radicals and rational exponents, you should not leave either in the denominator of an expression. To fix this, use the method of rationalizing the denominator. Multiply the expression by an appropriate form of 1 that creates a perfect *n*th power in the denominator.

Example: Simplify (a) $\frac{2}{\sqrt{3}}$ and (b) $\frac{5}{x^{1/3}}$.

a. $\frac{2}{\sqrt{3}} \bullet \frac{\sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{3}}{\sqrt{9}} = \frac{2\sqrt{3}}{3}$

b. $\frac{5}{x^{1/3}} \bullet \frac{x^{2/3}}{x^{2/3}} = \frac{5x^{2/3}}{x}$

Simplify the expression. Write your answer using only positive exponents.

1. $\frac{20\sqrt{2}}{2\sqrt{8}}$

2. $\frac{3 - \sqrt{2}}{\sqrt{12}}$

3. $x^{-5/3}$

4. $\left(x^{-4}\right)^{3/8}$

5. $x^{3} \bullet x^{-2/3} \bullet x^{1/2}$

6. $\frac{\sqrt[8]{16}}{\sqrt[5]{4}}$

7. $\sqrt[3]{\frac{125}{81}}$

8. $27^{1/2} \bullet 3^{-1/2}$

9. $\sqrt[6]{x^{-10}}$

10. $\frac{x^{2}}{x^{1/5}}$

11. $\left(-27\right)^{-4/3}$

12. $\frac{2x^{-1/3}}{x^{1/6} \bullet x^{-1/2}}$