Simplifying Square Roots (short version)

U se the following step-by-step procedure to "simplify" an expression involving radicals:

$$3x\sqrt{8x^5y^{12}}$$

$3x\sqrt{2^3 \cdot x^5 \cdot y^{12}}$

1 . Write the expres s ion under the radic al in exponential form by prime fac toring .

$3x\sqrt{2^2 \cdot 2^1 \cdot x^4 \cdot x^1 \cdot y^{12}}$

2. Rewrite the exponents of the radicand with even exponents that are less than or equal to the orig inal exponents.

$3x\sqrt{2^2 \cdot x^4 \cdot y^{12}}\ \sqrt{2^1 \cdot x^1}$

3 . S eparate perfect squares (i.e., even exponents) from odd exponents

$3x \cdot 2^1 x^2 y^6\ \sqrt{2^1 x^1}$

4 . T ake square root of the perfect squares.

$6x^3y^6\sqrt{2x}$

5. Simplify.

The radical part is now "simplified".