TSC | WILLIAM D. LAW, JR. LEARNING COMMONS

Simplifying Square Roots

Use the following step by step procedure to simplify an expression involving radicals:

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

Step 1 write the expression under the radical in exponential form by prim factoring.

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

Step 2 rewrite the exponents of the radicand with even exponents that are less than or equal to the original exponents.

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

Step 3 separate the perfect squares i.e. the even exponents from odd exponents

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

Step 4 take the square roots of the perfect squares

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

Step 5 simplify

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

The Radical Is Now Simplified!