Name: _____   Date: _____ Block: _____

Chapter 4: Exponents and Radicals

4.1: Perfect Squares, Cubes, and Prime Factorization

Perfect Square Number: Any whole number that has two equal factors.

Square Root: One of the two equal factors of a perfect square number.

Example:

Practice:

1. Find the <u>side length</u> of a square whose area is 25cm^2. Include a diagram, equation, and sentence in your answer.

Perfect Cube Number: Any whole number that has three equal factors.

Cube Root: One of the three equal factors of a perfect cube number.
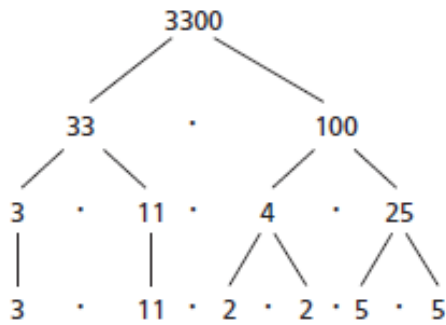
Example:

Practice:

1. Find the <u>edge length</u> of a cube whose volume is 216cm^3. Include a diagram, equation, and sentence in your answer.

2. The uranium that Saskatchewan produces in a year has a volume of about 512 m^3. If this volume were made into a single cube, what would be the dimensions of the cube?

Prime Factorization

Prime Number: A prime number has only two factors: _____ and itself.

Prime Factorization: Writing a number as a product of its prime factors

```
              3300
           /        \
        33      ·      100
       /  \           /    \
      3  · 11 ·     4   ·   25
      |      |     / \     / \
      3  · 11 · 2 · 2 · 5 · 5
```

Create a Factor Tree:

Find the prime factors of:

324   120

Example 1: Identify Perfect Squares and Perfect Cubes

State whether each of the following numbers is a perfect square, a perfect cube, both, or neither (and use **prime factorization** to show your thinking).

    a) 121   b) 729   c) 356

Example 2: Solve Square Roots and Cube Roots

Solve the following using prime factorization.

    a) $\sqrt[3]{125}$ b) $\sqrt{196}$ c) $\sqrt[3]{4096}$

Homework:

P. 158 #1 – 8 (pick 3)

#11, 12, 14, 16, 18