Math 9 Muscardin

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Chapter 2 – Exponents**

Test Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

To do:

2.1 – Exponents

* Complete Notes ⃝

2.2 – BEDMAS

* Complete Notes ⃝

2.3 – Square Roots of Perfect Squares

* Complete Notes ⃝

2.4 – Square Roots of Whole Numbers

* Complete Notes ⃝
* Quiz 1 ⃝

2.5 – Pythagorean Theorem

* Complete Notes ⃝

2.6 – Cubes and Cube Roots

* Complete Notes ⃝

2.7/2.8 – Exponent Laws

* Complete Notes ⃝
* Quiz 2 ⃝

Chapter Assignment Handout ⃝

**Write Unit Test ⃝**

Math 9 **Lesson 2.1 - Exponents** Muscardin

When a number is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by itself 2 or more times we can write it a shorter way, by using a raised number, called an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The base in a power is the number being \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The exponent tells how many times to multiply the base by itself.

**A negative is included in the base only when there are brackets.**

A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the number in front of the base, and is multiplied by the base.

**Examples:**

**Examples:** Evaluate and

Expand and evaluate:

Math 9 **Lesson 2.1 - BEDMAS** Muscardin

A special order of operations is to be done when there are several operations needed to simplify an expression.

**B**

**E**

**D**

**M**

**A**

**S**

**Examples:**

1. 3.
2. 4.

Math 9 **Lesson 2.3 – Square Roots of Perfect Squares** Muscardin

Finding the square root of a number is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a number squared. For example:

You can use prime factorization to find the square root of a perfect square. For example:

Another way to find the square root of a number is to find all the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the number. Factors are all the numbers that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into it. For example:

Whenever a number has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that factor is the square root of the number. So a perfect square will have an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ number of factors. For example:

**Examples:**

2. Solve for

1. Use prime factorization and factors to evaluate.

Math 9 **Lesson 2.4 – Square Roots of Whole Numbers** Muscardin

The square root of a number can also be determined by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ whose area is equal to that number. For example:

We can approximate the square root of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that is not a perfect square by determining what \_\_\_\_\_\_\_\_\_ perfect squares it is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. We use the perfect squares as benchmarks. For example:

Once you have an approximate value you can use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to be more accurate. (Use a number line)

A more accurate way of finding square roots of non-perfect numbers is to use a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It is important to understand how this tool works in order to correctly input the calculation to get the correct outcome! For example:

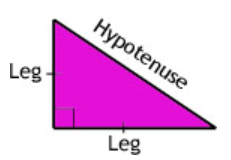
**Examples:**

1. Use your calculator to evaluate. Round your answer to 2 decimal places.

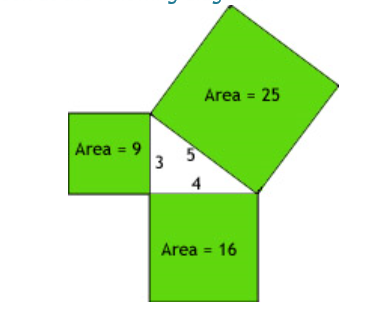
1. Approximate:

Math 9 **Lesson 2.5 – Pythagorean Theorem** Muscardin

Pythagoras, a Greek mathematician, showed that in any right triangle, there is a special relationship among the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. A right triangle is one that has two sides that form a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The side opposite the right angle is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the two shorter sides are called \_\_\_\_\_\_\_\_\_\_\_.



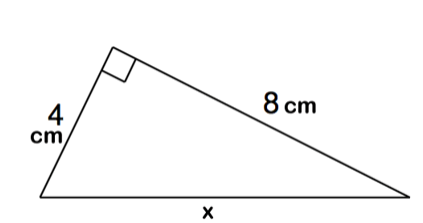
He found that: *The area defined by the square of the hypotenuse equals the sum of the areas defined by the squares of the other two sides.*

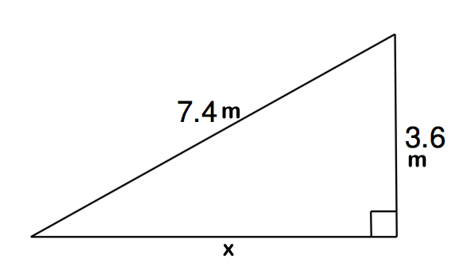


Hence,

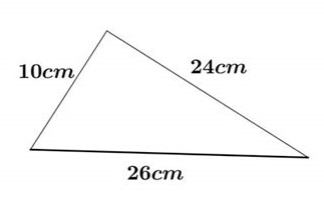
**Examples:**

1. Solve for the unknown in each of these right triangles:





1. Determine whether or not the following triangle has a right angle (Is it a **Pythagorean triplet**?):



Math 9 **Lesson 2.6 – Cubes and Cubes Roots** Muscardin

Any **whole** number multiplied by itself “twice” will result in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Perfect Cubes:

|  |  |  |
| --- | --- | --- |
| **Number** | **Number Cubed** | **Perfect Cube** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**\*\* You can use similar techniques for evaluating and estimating as you did with perfect squares and square roots \*\***

**Examples:**

1. Estimate:

1. Evaluate using calculator. Round answer to the nearest hundredth.

Math 9 **Lesson 2.7/2.8 – Exponent Laws** Muscardin

You can use the exponent laws to simplify an expression involving powers:

* To multiply powers with the same base, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the exponents
* To divide powers with the same base, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the exponents
* To raise a power to an exponent, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the exponents

Hence,

**Product of Powers**

**Quotient of Powers**

**Power of a Power**

**Raising a power to a Product**

**Raising a power to a Quotient**

**Zero Power**

**Negative Power**

**Examples:** Simplify