

# MATH LESSON PLAN 1

## MATHEMATICS

© 2015 Copyright Vinay Agarwala, Checked: 9/24/15

### **Section 1: What is Mathematics?**

1. The word MATHEMATICS comes from a Greek word, *máthēma*, which means “knowledge, study, learning”.
2. Mathematics informs us about many ways of learning. For example, we learn how many things are there by counting them. Counting is part of mathematics.

#### **Can you give an example of another way of learning something?**

Answer: We can learn about the sum of things by adding.

### **Section 2: Why should one study Mathematics?**

3. Mathematics is a special language. It teaches us how to work with numbers. And in that process it trains and disciplines our minds to think in a clear and precise manner.
4. Mathematics should be taught in such a way that it helps a person to think creatively with numbers. Solving math puzzles is a great way to start with math.
5. Here is an example of thinking creatively with numbers.

*A man gave his son the following riddle. “Take a 5-gallon and a 3-gallon bucket down to the lake, and bring back exactly 4 gallons of water.” How will you solve this riddle?*

#### **SOLUTION:**

Fill the 3-gallon bucket and empty it in the 5-gallon bucket.

Fill the 3-gallon bucket again and pour it till the 5-gallon bucket is full. You will have 1 gallon of water left in the 3-gallon bucket.

Empty the 5-gallon bucket back into the lake, and pour 1 gallon of water into it from the 3-gallon bucket.

Fill the 3-gallon bucket and empty it in the 5-gallon bucket.

You now have 4 gallons of water in the 5-gallon bucket.

$$3 + 3 - 5 + 3 = 4 \text{ gallons}$$



**Answer**

6. Math teaches you to visualize the problem when solving it. Here is an example.

*A water-lily doubles itself in size each day. From the time its first leaf appeared to the time when the surface of the pond was completely covered took forty days. How long did it take for the pond to be half covered?*



**SOLUTION:**

During the last and fortieth day the pond which was half covered becomes completely covered – just doubled in one day.

Therefore, the pond was half covered the previous day – the 39<sup>th</sup> day.

So it took 39 days for the pond to be half covered.

**Answer**

7. Math teaches you not to assume anything about the problem when solving it. Here is an example.

*There are three books, each one inch thick. They stand side by side in order – Volumes I, II, and III. A bookworm starts outside the front cover of Volume I and eats its way through to the outside of the back cover of Volume III. If the worm travels in a straight line, how far does it travel?*

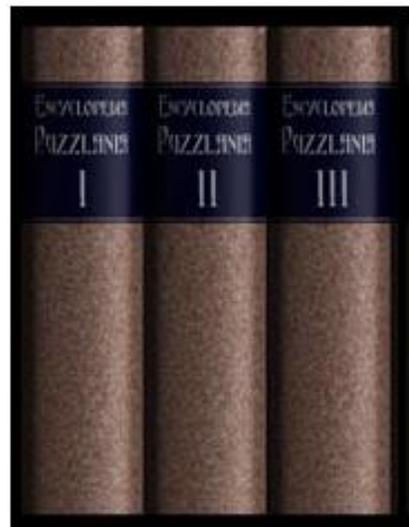
**SOLUTION:**

Check out 3 books on a book shelf. The outside the front cover of Volume I is actually in contact with Volume II, and so is the outside of the back cover of Volume III.

So the worm travels only through the thickness of Volume II.

The worm travels one inch.

**Answer**



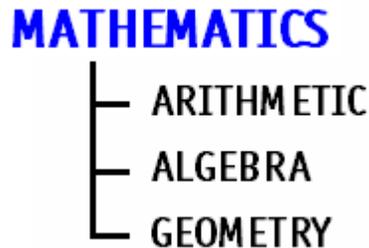
### See if you can solve the following problem

*If it takes 6 minutes to saw a log into three pieces, how long will it take to saw the same log into four pieces?*

Answer: 9 MINUTES. It takes 2 cuts for 3 pieces, and 3 cuts for 4 pieces. Each cut takes 3 minutes. Therefore, 3 cuts will take 9 minutes.

## **Section 3: Overview of Mathematics**

1. The basic parts of MATHEMATICS are as follows.



2. In Arithmetic we learn about numbers and how to add, subtract, multiply and divide them. The word ARITHMETIC literally means “number skill.”

Here is a “number skill” to find the sum of 97 and 64.

1. Imagine two stacks of 97 and 64 pennies.
2. Transfer 3 pennies from the 64-penny stack to 97-penny stack.
3. You now have two stacks of 100 and 61 pennies
4. We can add this quickly as 161 pennies.
5. Therefore, the sum of 97 and 64 is 161.



One learns many such skills in Arithmetic.

3. In Algebra, we use relationships to figure out unknown values. The word ALGEBRA literally means “binding together.”

Here is a relationship between Sam and his mother’s age.

1. When Sam was born his mother was 30 years old.
2. When Sam was 5, his mother was 35 years old.
3. When Sam was 10, his mother was 40 years old.
4. Therefore, when Sam is 40 years old, his mother would be 70.
5. The relationship of Sam’s age with his mother’s age is as follows. When Sam is ‘x’ years old, his mother would be ‘x + 30’ years old.

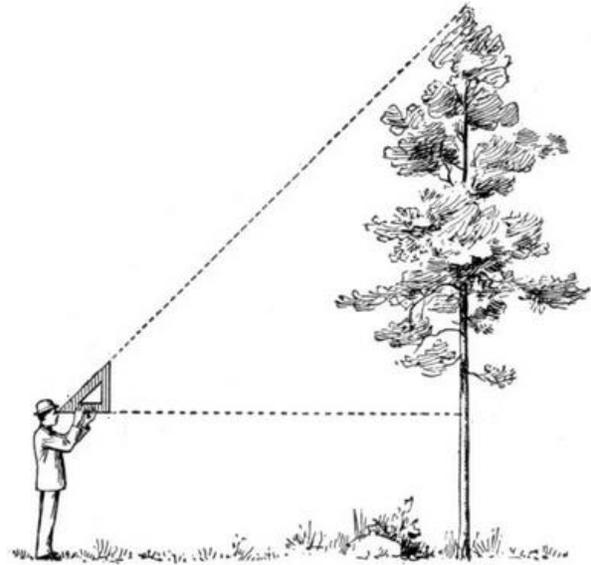


One learns many such relationships in Algebra.

4. In Geometry, we study the relationships in space so we can build things. The word GEOMETRY literally means “to measure land.”

Using angles one can find the height of a tree from a distance.

1. We move to a certain distance from the tree.
2. We then measure the angle of sight to the top of the tree.
3. We move to a place where this angle is 45 degrees.
4. Then distance from the tree plus your height will be same as the height of the tree.



One learns many such relationships in Geometry.

### ☺ **Lesson Plan 1: Check your Understanding**

1. Why should you study mathematics?
2. What are the main parts of Mathematics?
3. Which part of mathematics do you study from your childhood?
4. How is Algebra different from Arithmetic?
5. What is Geometry useful for?

***Check your answers against the answers given below.***

### **Lesson Plan 1: Answer**

- 1) Mathematics trains and disciplines our minds to think in a clear and precise manner
- 2) The main parts of mathematics are Arithmetic, Algebra and Geometry.
- 3) We study Arithmetic or “number skill” from our childhood.
- 4) Arithmetic teaches skill with numbers. Algebra helps to find an unknown value from a given relationship.
- 5) Geometry is useful for measuring things in space, such as lengths, widths, heights and directions.