

Your Name: _____

Montlake Math Challenge

April 9, 2009

The Golden Ratio

Introduction: Today we will discover a very special number Φ , the Greek letter PHI (pronounced "fee"), and see many natural occurrences of this number.

The first two numbers in the Fibonacci sequence are

1 1

the third number in the Fibonacci sequence is the sum of the first two

1 1 2

the fourth number in the Fibonacci sequence is the sum of the second and the third

1 1 2 3

Exercise 1: Write down the first twelve numbers in the Fibonacci sequence.

1 1 2 3 _____

Exercise 2: Now let's find the **ratio** of consecutive Fibonacci numbers, that is, $F_n \div F_{n-1}$:

	Fibonacci Number	Ratio
F_1	1	XXXXXXXXXXXXXXXXXX
F_2	1	1
F_3	2	2
F_4	3	1.5
F_5	5	
F_6	8	
F_7	13	
F_8	21	
F_9	34	
F_{10}	55	
F_{11}	89	
F_{12}	144	
F_{13}	233	
F_{14}	377	

Exercise 3: The **Golden Ratio Φ** is the number

$$\Phi = \frac{1 + \sqrt{5}}{2} = \underline{\hspace{2cm}}$$

Round Φ to 4 decimal places.

The Golden Ratio and YOU!

Instructions: Pair up with a friend. Use rulers to measure the following lengths on your body.

Exercise 3: Make the following measurements:

A = Length of your arm from ELBOW to WRIST = _____

H = Length of your hand from WRIST to FINGERTIP = _____

Find $A \div H$:

Exercise 4: Make your hand FLAT with your palm facing up. Make the following measurements:

K = Distance from the TIP of your middle finger to your FIRST knuckle = _____

L = Distance from the TIP of your middle finger to your SECOND knuckle = _____

Find $L \div K$: