We are learning about the magical number Φ (PHI pronounced "fee"). This number appears many places in our world, and today as math adventurers, we are going to find this number and see why it is so special.

Try and guess what Φ is…

What is the magic number Φ? _____

Part I – Φ in Nature

1) In Picture 1, use the ruler to measure the following line segments in centimeters:

A _____

B _____ $\frac{B}{A}$ = _____ (Divide)

C _____ $\frac{C}{B}$ = _____ (Divide)

D _____ $\frac{D}{C}$ = _____ (Divide)

2) In Picture 2, use the ruler to measure the following line segments in centimeters:

A _____

B _____ $\frac{B}{A}$ = _____ (Divide)

C _____ $\frac{C}{B}$ = _____ (Divide)

D _____ $\frac{D}{C}$ = _____ (Divide)

3) In Picture 3, use the ruler to measure the following line segments in centimeters:

A _____

B _____ $\frac{B}{A}$ = _____ (Divide)

C _____ $\frac{C}{B}$ = _____ (Divide)

D _____ $\frac{D}{C}$ = _____ (Divide)

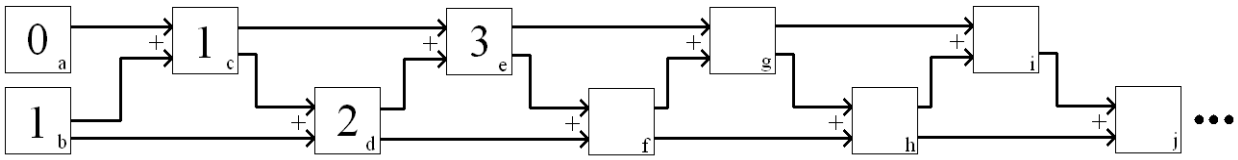
Part II – Φ in Math: The Fibonacci Sequence

Definition: Sequence - (noun) An ordered set of numbers, shapes, or other mathematical objects, arranged according to a rule.

Example: 1,2,3,4,5,6,7… The rule for this sequence is to add 1 to the previous number

Leonardo of Pisa, known as Fibonacci, introduced a specific sequence of numbers to the Western world in his 1202 book, *Liber Abaci*. The sequence starts with two numbers 0 and 1. To find the next number of the sequence, we add the two previous numbers: in this case 0 + 1 = 1. Now we have the sequence 0, 1, 1. To find the next number of the sequence, we repeat the above procedure forming 1 + 1 = 2. Therefore, now we have the sequence 0, 1, 1, 2. Continuous repetition of the above procedure yields a sequence that continues forever to, what mathematicians call, infinity. The Fibonacci has attracted attention because it shows up in the form of spirals, in such things as sunflowers and snail shells.

Fill in the empty boxes of the Fibonacci sequence below:



$\frac{C}{B}$ = _____ (Divide)

$\frac{D}{C}$ = _____ (Divide)

$\frac{E}{D}$ = _____ (Divide)

$\frac{F}{E}$ = _____ (Divide)

$\frac{G}{F}$ = _____ (Divide)

$\frac{H}{G}$ = _____ (Divide)

$\frac{I}{H}$ = _____ (Divide)

$\frac{J}{I}$ = _____ (Divide)

Try to put the pieces of the Fibonacci box puzzle together. Have you seen the shape of the dotted line in nature?