

Fibonacci Fun

Problem 1a: The Fibonacci Sequence

Refer to pages 1.1 through 1.4 in the .tns file.

The first two numbers of the Fibonacci sequence are 1 and 1. Each subsequent number is the sum of the two previous numbers.

1, 1, 2, 3, 5, 8, 13, ...

Find the first 20 numbers in the Fibonacci sequence.

1	1	2	3	5	_____	_____	_____	_____	55
_____	_____	_____	377	_____	_____	_____	_____	4181	_____

Problem 1b: Divisibility and the Fibonacci Sequence

Refer to pages 1.5 through 1.7 in the .tns file.

1. Which terms of the Fibonacci sequence are divisible by 5?

2. Can you make a generalization about divisibility by 5?

3. Which terms of the Fibonacci sequence are divisible by 3?
4. Can you make a generalization about divisibility by 3?
5. Which Fibonacci numbers are even?
6. Make some other conjectures about divisibility and the Fibonacci sequence.

Problem2: Looking Good with Fibonacci

Refer to page 2.1 in the .tns file.

1	1	2	3	5	8	13	21	34	55
89	144	233	377	610	987	1597	2584	4181	6765

Find the ratios of consecutive Fibonacci terms, larger divided by smaller.

$$2/1 = \qquad 21/13 =$$

$$3/2 = \qquad 34/21 =$$

$$5/3 = \qquad 55/34 =$$

$$8/5 = \qquad 89/55 =$$

$$13/8 = \qquad 144/89 =$$

What do you notice about the quotients?

Predict what will happen with the next ten quotients.

$$233/144 = \qquad 1597/987 =$$

$$377/233 = \qquad 2584/1597 =$$

$$610/377 = \qquad 4181/2584 =$$

$$987/610 = \qquad 6765/4181 =$$

Was your predication accurate? Explain.

Problem 3: Four, Five, Six with Fibonacci

Refer to page 3.1 in the .tns file.

1	1	2	3	5	8	13	21	34	55
89	144	233	377	610	987	1597	2584	4181	6765

Six: Find the sum of any six consecutive terms of the Fibonacci sequence.

Four: Divide the sum by 4.

Five: What do you notice?

Now repeat with six other consecutive terms.

Six: Find the sum of any six consecutive terms of the Fibonacci sequence.

Four: Divide the sum by 4.

Five: What do you notice?

Refer to page 3.2 in the .tns file.

Prove that the sum of any six consecutive terms of the Fibonacci sequence divided by 4 will always equal the 5th of the six consecutive terms.