Unit 1 Lesson 9: What's the Equation?

1 Math Talk: Multiplying Fractions (Warm up)

Student Task Statement

For the function $f(x) = 32 \cdot \left(\frac{3}{4}\right)^x$, evaluate mentally:

$f(0)$

$f(1)$

$f(2)$

$f(3)$

2 Take the Cake!

Student Task Statement

A large cake is in a room. The first person who comes in takes $\frac{1}{3}$ of the cake. Then a second person takes $\frac{1}{3}$ of what is left. Then a third person takes $\frac{1}{3}$ of what is left. And so on.

1. Complete the table for $C(n)$, the fraction of the original cake left after n people take some.
2. Write two definitions for C: one recursive and one non-recursive.
3. What is a reasonable domain for this function? Be prepared to explain your reasoning.

n	$C(n)$
0	
1	$\frac{2}{3}$
2	
3	
4	

3 Fibonacci Squares

Student Task Statement

1. On graph paper, draw a square of side length 1. Draw another square of side length 1 that shares a side with the first square. Next, add a 2-by-2 square, with one side along the sides of *both* of the first two squares. Next, add a square with one side that goes along the sides of the previous two squares you created. Next, do it again.
   Pause here for your teacher to check your work.
2. Write a sequence that lists the side lengths of the squares you drew.
3. Predict the next two terms in the sequence and draw the corresponding squares to check your predictions.
4. Describe how each square's side length depends on previous side lengths.
5. Let $F(n)$ be the side length of the n^{th} square. So $F(1) = 1$ and $F(2) = 1$. Write a recursive definition for F.

Images for Activity Synthesis

Step 1

Step 2

Step 3