

Attendance Quiz # 1 for Dr. Z.'s MathHistory for Lecture 1 (due no later than 10 minutes after class)

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Email to DrZlinear@gmail.com right after class

Subject: p1

with an attachment p1FirstLast.pdf

Part I: List all the "attendance questions" during the lecture, followed by your answers.

Part II:

1. (a) Use the **greedy algorithm** to express  $\frac{7}{12}$  as an Egyptian fraction. Use this to equally divide 7 pizzas among 12 people.

$$\frac{1}{x} = \frac{12}{7}, \text{ceil}(1/x) = 2$$

$$\frac{7}{12} = \frac{1}{2} + \left(\frac{7}{12} - \frac{1}{2}\right) = \frac{1}{2} + \frac{1}{12}$$

Divide the first six pizzas into two equal halves and give them to the 12 people.

Divide the last pizza into twelve equal parts and give each person one of the pieces.

(b) Note that a better way to express  $\frac{7}{12}$  as an Egyptian fraction is

$$\frac{7}{12} = \frac{1}{3} + \frac{1}{4}$$

Use this better way to equally divide 7 pizzas among 12 people. Why is it better?

$$\frac{7}{12} = \frac{4+3}{12}$$

Divide the first four pizzas into three equal parts and give to each person, then divide the last three pizzas into four equal parts and give to each person. It is harder to divide a pizza into twelve equal parts as opposed to dividing into three or four equal parts.

2. Find the two smallest positive integers  $n$ , that have the property that

• If you divide  $n$  by 3 you get remainder 1.

• If you divide  $n$  by 5 you get remainder 2.

$$f(0) = (0, 0) \quad f(3) = (0, 3) \quad f(6) = (0, 1)$$

$$f(1) = (1, 1) \quad f(4) = (1, 4) \quad f(7) = (1, 2)$$

$$f(2) = (2, 2) \quad f(5) = (2, 0)$$

So  $\boxed{7}$  is the smallest positive integer  
then  $7 + (3 \cdot 5) = 7 + 15 = \boxed{22}$  is the next smallest.

Part I:

① According to Google, who is the greatest mathematician of all time?

Answer: Archimedes

② Where did Dennis DeTurck go for his undergraduate degree?

Answer: Drexel University

③ What university did Shamir get his PhD from?

Answer: Weizmann Institute