QUIZ 2   (MATH 61, SPRING 2017)

Your Name: --

UCLA id: -------------------------------------

Math 61 Section: -----------

Date: ----------------------

The rules:

This is a multiple choice quiz. You must circle answers with an ink pen.
If two or more answers are circled, the answer is not accepted.
You are allowed to use only this paper and pen/pencil. No calculators.
No books, no notebooks, no phones, no web access. Automatic deduction for these.
You MUST write your name in ink.

Points: (10 per correct answer)

Question 1. The first six terms of $\{a_n,\ n = 1, 2, \ldots\}$ are $1, 1, 2^2+2, 2^3-3, 2^4+4, 2^5-5, \ldots$
Then a_{10} is equal to:

$$2^9 - 9 \qquad 2^9 + 9 \qquad 2^{10} - 10 \qquad 2^{10} + 10 \qquad 2^{11} - 11 \qquad 2^{11} + 11$$

Question 2. Which of these sequences $\{a_n\} = (1, 2, 3, 5, 8, 11, \ldots)$, $\{b_n\} = (10, 19, 28, 37, \ldots)$,

$$\{c_n\} = \left(\frac{2}{1}, \frac{3}{2}, \frac{4}{3}, \frac{5}{4}, \frac{6}{5}, \frac{7}{6}, \cdots\right) \qquad \{d_n\} = \left(\frac{1}{2}, \frac{2}{3}, \frac{3}{5}, \frac{5}{8}, \frac{8}{13}, \frac{13}{21}, \cdots\right)$$

are increasing? *Circle all that apply!*

$$\{a_n\} \qquad \{b_n\} \qquad \{c_n\} \qquad \{d_n\} \qquad \text{I need more terms!}$$

Question 3. The relation R on $\mathbb{Z}$ is defined by xRy if and only if $x + y = 0 \mod \mathbf{2}$,
for all $x, y \in \mathbb{Z}$. Then R is:

$$\text{ref} \qquad \text{sym} \qquad \text{ref, sym} \qquad \text{ref, tr} \qquad \text{sym, tr} \qquad \text{eq}$$

(here ref=reflexive, sym=symmetric, tr=transitive, eq=equivalence relation)

Question 4. The relation R on $\mathbb{Z}$ is defined by xRy if and only if $x + y = 0 \mod \mathbf{4}$,
for all $x, y \in \mathbb{Z}$. Then R is:

$$\text{ref} \qquad \text{sym} \qquad \text{ref, sym} \qquad \text{ref, tr} \qquad \text{sym, tr} \qquad \text{eq}$$

Question 5. We proved in class that $F_n \leq 2^n$ for all $n \geq 1$

$$\text{by induction} \qquad \text{by contradiction} \qquad \text{by case analysis} \qquad \text{by another method}$$