

UW Math Circle

October 9, 2014

Homework

1. You ask your friend for change for a \$20 bill so you can buy some candy at the vending machine. Your friend gives you a total of 7 bills, that are either \$1 or \$5. Did your friend give you \$20?



2. Do there exist natural numbers a and b such that $ab(a - b) = 656565$?
3. Mark is designing a video game that takes place on a 200×200 grid. Two players start on opposite corners of the grid, and on each move, they can either jump 3 squares left/right and 4 squares up/down or 2 squares left/right and 2 squares up/down. Mark knows his game will crash if the players ever land on the same square, so he asks you for help: is it possible for the two players to end up on the same square after some number of moves?
4. Draw a broken line consisting of 4 segments that passes through all 9 points below.
(A "broken line" means you draw the whole line without picking up your pencil from the paper, but it can have corners.)

