UCLA Math Circle

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Abstract

More problems on modular arithmetic to accompany the UCLA Math Circle Intermediate-2 for Summer Session 2020, August 16th.

Diophantine Equations

Problem 1

Find integer solutions to the Diophantine equation $2x + 3y = 0$. What about $2x + 3y = 1$? And $2x + 3y = 31$? Think about how you can get the third equation from the second equation.

Problem 2

Suppose we have a solution (x_0, y_0) to the Diophantine equation $ax + by = 1$. Let n be an arbitrary integer. Show there is a solution to the Diophantine equation $ax + by = n$. Find a solution.