

Homework No.1

student:
due 05/20/2010

Problem A: Solutions of diophantine equations.

P	C	N
-/6	-/2	-/2

- 1) One solution of the diophantine equation $3x + 5y + 7z + 11 = 0$ is given by $x =$, $y =$, $z =$.
- 2) One solution for the diophantine equation $x^2 - y^2 = 20$ is given by $x =$, $y =$.
- 3) One solution of the diophantine equation $y^2 = x^3 + 31$ is given by $x =$, $y =$.
- 4) Write a diophantine equation, which has amongst its solutions $x = 2, y = 3$ and $x = 3, y = 2$ but not $x = 0, y = 5$.

Problem B: Diophantine equations without solutions.

P	C	N
-/6	-/2	-/2

- 1) Give a reason why the diophantine equation $30x - 21y + 7 = 0$ has no integral solutions.
- 2) Give a reason why the diophantine equation $x^2 + y^2 + z^2 = 47$ has no integral solutions.
- 3) Give a reason why the diophantine equation $x^2 - 6x + y^2 + 12 = 0$ has no integral solutions.
- 4) Write a diophantine equation, which has no solutions, for a reason different than the ones you gave above.

Problem C: Find all solutions of the diophantine equation $x^2 + y^2 = 5z^2$, using any of the methods we learned in class.

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Problem D: In the notes for Lecture 1 read carefully pages 3 and 4 and identify three statements that were mentioned but not explicitly proved. (There are more than three such statements.) Give a justification for two of the statements you selected.

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