

Math 215 Fall 2018
Problem Set 2
Due: September 10, 2018

(22 points) Make sure you are familiar with the Academic Honesty policies for this class, as detailed on the syllabus. All work is due on the given day by the time lecture starts.

1. (4 points) Negate the following statements. You do not need to prove or disprove the statements, simply write the negation so that no “not” appears.
 - (a) For all $x \in \mathbb{R}$, we have $x^3 \geq x^2$.
 - (b) There exists an $x \in \mathbb{Z}$ such that for all $y \in \mathbb{Z}$ we have $2x + 3y = 1$.
2. (3 points each) Prove or disprove each of the following.
 - (a) There exists an n in \mathbb{N} such that $n^2 - 1 = 0$.
 - (b) For all x in \mathbb{R} we have $x^2 + 1 = (x + 1)^2$.
 - (c) There exists an x in \mathbb{R} such that $\sin x = \cos x + 3$.
 - (d) There exists an integer n so that $n > 3$ and $n < -5$.
 - (e) There exists an $x \in \mathbb{Z}$ so that for all $y \in \mathbb{Z}$ we have $y^2 > x$.
 - (f) For all $x \in \mathbb{N}^+$ there exists a $y \in \mathbb{N}^+$ such that $xy = 1$.