Math 220 Homework 7

Due on November 1, 2021 Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Let us say that two integers are ***near*** one another provided the absolute value of their difference is 3 or smaller (i.e. the numbers are at most 3 apart). For example, 3 is near to 6, 10 is near 9, but 8 is not near 4. Let *R* stand for this is-near-to relation. Please do the following:

a. Write down *R* as a set of ordered pairs. Your answers should look like this:

= {( , ): ⋯ }

* 1. Prove or disprove: *R* is reflexive.
  2. Prove or disprove: *R* is irreflexive.
  3. Prove or disprove: *R* is symmetric.
  4. Prove or disprove: *R* is antisymmetric.
  5. Prove or disprove: *R* is transitive.

1. For each equivalence relation below, find the requested equivalence class.
   1. = { (1, 1), (1, 3), (3, 1), (2, 2), (3, 3), (4, 4)} on {1, 2, 3, 4}. Find [1].
   2. = { (1, 1), (1, 3), (3, 1), (2, 2), (3, 3), (4, 4)} on {1, 2, 3, 4}. Find [4].
   3. *R* is has-the-same-tens-digit-as on the set { ℤ ∶ 100 < < 200}. Find [132].
2. *R* is has-the-same-parents-as on the set of all human beings. Find [you].