# Assignment 1

1 Question: Write formal descriptions of the following sets: (note that you should give the finite sets by listing their contents)

Question: The set of all integers that are less than 5

Answer:   


Question: The set of all positive integers that have a remainder of 3 if divided by 5

Answer:



Question: The set of all substrings of *baab*

Answer:



Question: The cross product of {0, 1, 3} and {0, 1}

Answer:



2 Question: Give examples of relations that have the following combination of properties:

Question: symmetric and reflexive but not transitive

Answer:



Question: symmetric and transitive but not reflexive

Answer:



3 Question: For each of the following equivalence relations, list their equivalence classes (using a representative element for each class):

Question: R1 = {(x, y) : x, y ∈ Znonneg and 3|(x − y)}

Text

Description automatically generated

Answer:



Question: R2 = {(x, y) : x, y ∈ {0, 1} 2022 and the first symbol in x is the same as the  
first symbol in y}



Answer:

A picture containing text

Description automatically generated

Question: Given languages L1, L2, and L3 such that \_\_\_\_ and \_\_\_\_\_ demonstrate these  
properties.  
Text, letter

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Answer 1: 

Answer 2:  

Question: Show that 2 − √ 2 is irrational. (Note that, we already know that √ 2 is not rational.)