HW0

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This is an inline equation $x + y = 3$
This is a displayed equation:

$$x + \frac{y}{z - \sqrt{3}} = 2$$

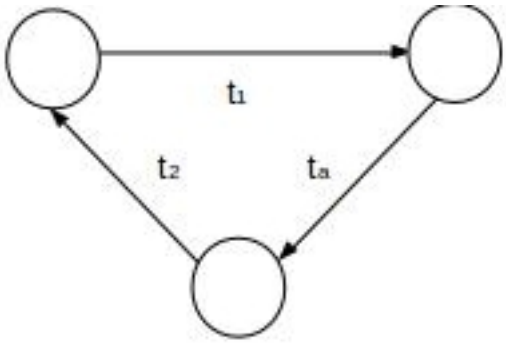
This is how you define a piece-wise linear function:

$$f(x) = \begin{cases} 3x + 2 & \text{if x} < 0 \\ 7x + 2 & \text{if x} \geq 0 \text{ and x} < 10 \\ 5x + 22 & \text{otherwise.} \end{cases}$$

This is a matrix:

9	9	9	9
6	6	6	
3		3	3

This is a figure incorporated in a LaTeX file



2. Show that N (natural numbers) and Z (integer numbers) are equinumerous.
To show that the set of natural numbers and integer numbers are equinumerous we have to show the cardinality of N and Z are the same. If there is a function f: N $\rightarrow$ Z that is bijective then the cardinalities of sets N and Z would be the same.

Suppose we have a function where $x \in N$ and $f(x) \in Z$

$$f(x) = \begin{cases} 0 & \text{if x equals 0} \\ \frac{x}{2} * -1 & \text{if x mod 2} = 0 \\ \frac{(x-1)}{2} + 1 & \text{otherwise.} \end{cases}$$

If f is onto then $\forall_y \in$ Z $\exists_x \in N$ where $f(x) = y$. Using existential instantiation and universal instantiation either $\frac{x}{2} * -1 = y$ or $\frac{(x-1)}{2} + 1 = y$.