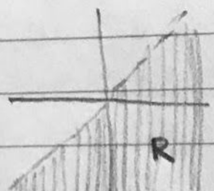
Math 8 HW #16

11.1. 5) $A = \{0,1,2,3,4,5\}$

$R = \{(3,3)(4,3)(4,2)$
$(1,2)(2,5)(5,0)\}$

11) Given a finite set, there should be $2^{|A|^2}$ diff relations on A

12)



$R = \{(x,y) : y \leq x\}$
where $x,y \in \mathbb{R}$

11.2) 1) · Reflexive since $(x,x) \in \mathbb{R}$ for every $x \in A$.

· Symmetric, not possible to find $(x,y) \in \mathbb{R}$ for which $(y,x) \notin \mathbb{R}$

· Transitive since $xRy \cap yRz$ implies xRz is always true

3) · Not reflexive, $(a,a) \notin \mathbb{R}$

· Not symmetric, $(a,b) \in \mathbb{R}$ but $(b,a) \notin \mathbb{R}$

· Not transitive, cRb & bRc are correct, cRc is false

8) $R = \{(x,y) \mid |x-y| < 1\}$

· For this to be true, $x = y$ such that $|x-y| = 0$

· $x = y$, R is reflexive since $|x-x| = 0 < 1$

· $x = y$, $xRy = yRx$ so R is symmetric

· xRy · yRz and $x = y$ & $y = z$ the $x = y \Rightarrow xRz$ is true (transitive)

· R is an equivalence relation

17) · Reflexive, all integers can follow $|x-x| = 0 \leq 1$ for all integers x

· Symmetric since $x \sim y$ iff $|x-y| \leq 1$ iff $|y-x| \leq 1$ iff $y \sim x$

· Not transitive since $0 \sim 1$ and $1 \sim 2$ but $0 \sim 2$ is not true