

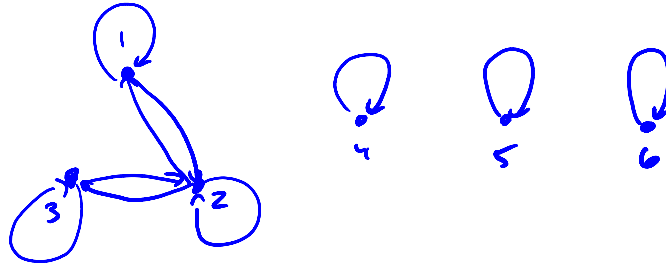
Math 270 - Basic Discrete Mathematics
Practice Quiz on Section 8.2

Solutions

Directions: Answer the problems given below.

1. Let $A = \{1, 2, 3, 4, 5, 6\}$. Draw the directed graph for a relation R on A which is reflexive and symmetric but not transitive. (You only have to draw the directed graph for such a relation.)

There are lots of ways to define one, but here is one:



Reflexive: $xRx \quad \forall x \in A$

Symmetric: if xRy then yRx

Not Transitive: $1R2$ and $2R3$
but $1R3$.

2. Let S be the relation on \mathbb{Z} defined as follows:

$$\text{For all } x, y \in \mathbb{Z}, xSy \Leftrightarrow x < y - 1.$$

In a.-c. circle the correct response (Yes or No). You do not need to justify your answers.

a. Is S reflexive? Yes or No

b. Is S symmetric? Yes or No

c. Is S transitive? Yes or No

But if you did,

a. $0 \not S 0$ as $0 \not < -1$

b. $0 S 2$ but $2 \not S 0$

c. If $x < y - 1$ and $y < z - 1$,
then $x < (z - 1) - 1 < z - 1$,
so $(xSy) \wedge (ySz) \Rightarrow xSz$