Example questions

For each of the three relations defined below:
- Draw a graph (circles and arrows) corresponding to the relation
- Say whether the relation is:
    + reflexive, irreflexive, neither
    + symmetric, anti-symmetric, neither
    + transitive, not-transitive

Relation 1, r_1, on the set of people {Leon, Jill, Maria, Tim, Kate}
  r_1 = {(Leon, Kate), (Kate, Leon), (Kate, Kate), (Maria, Jill), (Jill, Maria),
     (Maria, Maria), (Tim, Leon), (Leon, Tim)}

Relation 2, r_2, on the set of food {pizza, fries, hotdog, burger, soda}
  r_2 = {(soda, soda), (soda, hotdog), (soda, pizza), (burger, fries), (fries, burger),
     (fries,fries), (pizza, fries), (pizza, burger) }

Relation 3, r_3, on the set of numbers {1,2,3,4,5,6,7,8}
  r_3 = {(1, 1), (1,4), (1,8), (3, 3), (4, 4), (4,8), (5, 5), (5,8), (8, 8)}
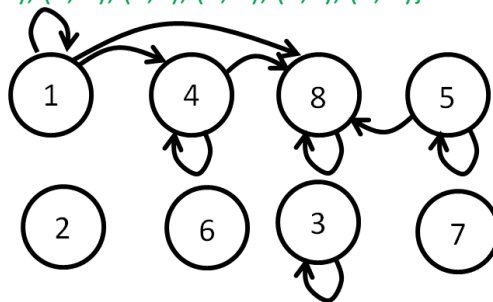
Not reflexive, antisymmetric, transitive

Write out the set of ordered pairs in the following relations on the integers $\mathbb{Z}$:
(x,y) is in the relation if and only if y > 3x

(x,y) is in the relation if and only if 3x-y=4

{…, (-1,-7), (0,-4), (1,-1), (2,2), …}

(x,y) is in the relation if and only if $\frac{x}{y}$=5

(x,y) is in the relation if and only if x-3=2y

Consider the following relations on the set of all people and say whether the resulting relations are: reflexive, irreflexive, or neither; symmetric, anti-symmetric, or neither; transitive or not
Has as many siblings as
Is shorter than
Irreflexive, antisymmetric, transitive
Has bought food at the same restaurant as
Reflexive, symmetric, not transitive
Took the same Spring 2014 classes as