REFLEXIVE

Which of the following are reflexive relations on the set of people in the world?

a lives within a mile of b
a is taller than b
a has the same birthday as b
a has a common grandparent with b
a lives in the same country as b

SYMMETRIC

Which of the following are symmetric relations on the set of people in the world?

a lives within a mile of b
a is taller than b
a has the same birthday as b
a has a common grandparent with b
a lives in the same country as b

TRANSITIVE

Which of the following are transitive relations on the set of people in the world?

a lives within a mile of b
a is taller than b
a has the same birthday as b
a has a common grandparent with b
a lives in the same country as b

EQUIVALENCE RELATIONS

Which of the following are equivalence relations on the set of people in the world?

a lives within a mile of b
a is taller than b
a has the same birthday as b
a has a common grandparent with b
a lives in the same country as b

For all equivalence relations, find the quotient sets.

EQUIVALENCE RELATIONS

Are the following relations on $\mathbb{Z}$ reflexive? symmetric? transitive?

$\leq$

$\neq$

$\{(x,y) \mid |x-y| \leq 1\}$

$\{(x,y) \mid x-y \text{ is divisible by } 10\}$

$\{(x,y) \mid x-y \text{ is divisible by } 2\}$

For all equivalence relations, find the quotient set.

PICTURES

What relations on $\mathbb{R}$ or $\mathbb{Z}$ are depicted?