▶ **Problem 2.4-23** Repeat Exercise 21 for $A = \{1, 2, 3, 4, 5, 6, 7\}$ and the relation on A defined by $a \sim b$ if and only if $\frac{a}{b}$ is a power of 2, that is, $\frac{a}{b} = 2^t$ for som integer t, positive, negative, or zero.

Solution. (a) The order pairs of $\sim$ are $(1,1)$, $(1,2)$, $(1,4)$, $(2,1)$, $(2,2)$, $(2,4)$, $(3,3)$, $(3,6)$, $(4,1)$, $(4,2)$, $(4,4)$, $(5,5)$, $(6,3)$, $(6,6)$, $(7,7)$.

(b)

$\overline{1} = \{1, 2, 4\} = \overline{2} = \overline{4}$;

$\overline{3} = \{3, 6\} = \overline{6}$;

$\overline{5} = \{5\}$;

$\overline{7} = \{7\}$;

(c) The set $\{1, 2, 4\}$, $\{3, 6\}$, $\{5\}$, $\{7\}$ partition A, so the given relation is an equivalence relation. □