1. Let $A = \{-1, 1, 2, 4\}$ and $B = \{1, 2\}$.

   Define relations R and S from A to B by

   $\quad$ $a\,R\,b$ iff $|x| = |y|$

   $\quad$ $a\,S\,b$ iff $x - y$ is even

   Explicitly list the ordered pairs in $A \times B, R, S, R \cup S,$ and $R \cap S$ $\qquad$ Epp, Exercise 8.1.20

2. For each relation,
   - Give three ordered pairs in the relation
   - Give three ordered pairs not in the relation
   - Determine whether the relation is reflexive, symmetric, transitive, or none of these.

   (a) C is the circle relation on $\mathbb{R}$: $\forall x, y \in \mathbb{R}$, $x\,C\,y$ iff $x^2 + y^2 = 1$

   (b) F is the mod 5 congruence relation on $\mathbb{Z}$: $\forall m, n \in \mathbb{Z}$, $m\,F\,n$ iff $m \equiv n \mod 5$

   $\qquad$ Epp, Exercises 8.2.10, 13, 17