Homework 18

1)
a) reflexive, symmetric, antisymmetric, transitive
b) irreflexive
c) transitive
d) symmetric
e) reflexive, antisymmetric, transitive

2)
a) reflexive, symmetric, transitive
b) irreflexive
c) reflexive, symmetric, transitive
d) reflexive
e) irreflexive, symmetric
f) irreflexive, transitive

3)

reflexive	no	because $5\mid(2+3) \land 5\nmid(2+2)$
irreflexive	no	because $5\mid(5+5) \land 5\mid(5+0)$
symmetric	yes	because $a+b = b+a$
antisymmetric	no	because $5\mid(2+3) \land (2\neq 3)$
transitive	no	because ~~$5\nmid(1+4)\land 5\nmid(4+6)\land 5\nmid$~~

$$5\mid(1+4) \land$$
$$5\mid(4+6) \land$$
$$5\nmid(1+7)$$

(but 3×4 is even) 2

4)

reflexive	no	because 3×3 is odd
irreflexive	no	because 2×2 is even
symmetric	yes	because $a\times b = b\times a$
antisymmetric	no	because $2\times 1 = 1\times 2$ is even
transitive	no	because ~~$\land$~~

1×2 is even
2×3 is even
1×3 is odd.