HW 2 §1.6 - 1.10

1) (a) False. The only x with $RightOf(C, x) = T$ are 5 & A, neither of which is even.

(b) True. The odd integers here are 5 & 7, both prime.

(c) True. For example, $x = A$ makes the predicate true (vacuously).

(d) True. $y = A$ is a vowel, & every even number (2 & 4) is to its right.

2) a) $F(Lucy, Sally) \wedge \neg C(Lucy, Sally)$

b) $\forall x \exists y \; F(x, y)$

c) $\exists x \forall y \; F(x, y)$

d) skip

e) $\forall x \, (C(x, Bob) \rightarrow \neg F(x, Bob))$ OR $\forall x \, (F(x, Bob) \rightarrow \neg C(x, Bob))$

f) $\forall x \forall y \, ((x \neq y) \wedge F(x, Cindy) \wedge F(y, Cindy) \rightarrow F(x, y))$

g) $\forall x \neg C(x, Doug)$

3) a) $\forall x \exists y$ True (Given x, choose $y = 7 - x$) $\qquad$ $\exists y \forall x$ False (Given y, choose $x = -y$)

b) True ← Commutative Law of + → True

c) True (Given x, choose $y = x$) $\qquad$ False (Given y, choose $x = y + 1$) $\qquad$ $x^2 - 2xy + y^2 = (x - y)^2$

d) True ← Choose $y = -5$ → True

4) a) $\forall x \exists y \; x + y \neq y$

b) There is some graph that is not connected, nor is its complement connected.