**3.1**

**5b.** Q(-3, 2) because the hypothesis, -3 < 2, is true but the conclusion, 9 < 4, is false.

**5d.** Q(5, 10) the hypothesis, 5 < 10, is true as well as the conclusion: 25 < 100.

**27c.** False, there are no squares above d.

**27d.** True, g is a triangle that has f above it.

**3.2**

**40.** If a number is divisible by 8, then it is divisible by 4.

**42.** If a person is obtaining a master’s degree, then the person must pass a comprehensive exam.

**3.3**

**49.**

a. True since all triangles are blue, if we pick a circle or square for x then y can be a triangle and vice versa. If the blue square is chosen then a black or gray circle can be chosen for y.

b. ∀x (∃y(x ≠ y ∧ ~SameColor(x, y)))

c. ∃x(∀y(x ≠ y ∨ SameColor(x, y)))

**50.**

a. True for the same reasons as 49a.

b. ∀x (∃y(x ≠ y → ~SameColor(x, y)))

c. ∃x(∀y(x ≠ y ∧ SameColor(x, y)))

**3.4**

**13.** True because the statement is in the form of Universal Modus Ponens

**19c.** True because the statement is in the form of Universal Modus Tollens