Exercise 1.6

1. Find the argument form for the following argument and determine whether it is valid. Can we conclude that the conclusion is true if the premises are true? If Socrates is human, then Socrates is mortal.

Socrates is human.

∴ Socrates is mortal.

3. What rule of inference is used in each of these arguments?

a) Alice is a mathematics major. Therefore, Alice is either a mathematics major or a computer science major.

5. Use rules of inference to show that the hypotheses “Randy works hard,” “If Randy works hard, then he is a dull boy,” and “If Randy is a dull boy, then he will not get the job” imply the conclusion “Randy will not get the job.”

7. What rules of inference are used in this famous argument? “All men are mortal. Socrates is a man. Therefore, Socrates is mortal.”

Exercise 1.7

3. Show that the square of an even number is an even number using a direct proof.

17. Show that if n is an integer and n3 + 5 is odd, then n is even using

a) a proof by contraposition.

b) a proof by contradiction.