

Homework 1 Key

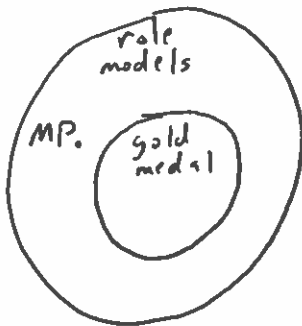
1.1 (1-10, 31-37, 65, 66)

1.2 (3, 5, 7-15, 36-40)

Note: only solutions to even-numbered problems are included because you should have odd-numbered solutions in your textbook

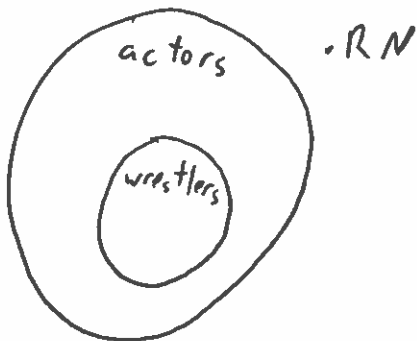
Section 1.1

2)



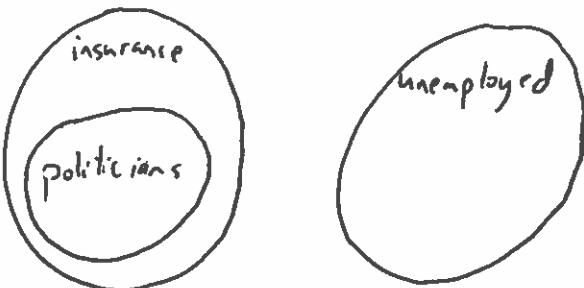
The argument is invalid.

4)



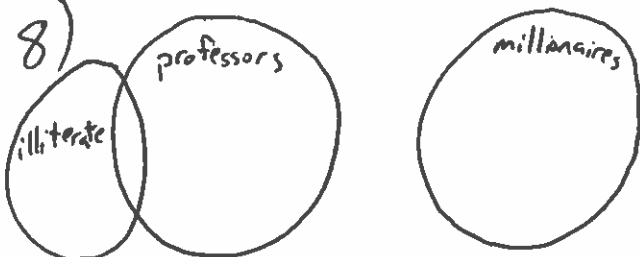
The argument is valid

6)



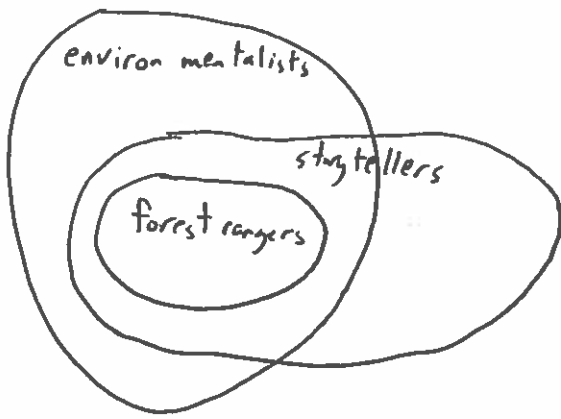
The argument is valid

8)



The argument is invalid

10)

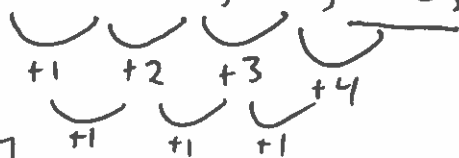


The argument is invalid.

32a) The argument is inductive since it reasons from specific instances to a general principle

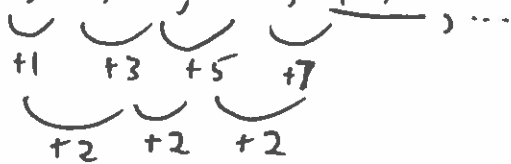
b) The argument is deductive since it reasons from a general principle (about all spicy food) to a specific case (about chili dogs)

34) 10, 11, 13, 16, 20, ...



There are many ways of describing this pattern. One is to observe that the second differences are always +1

36) 1, 2, 5, 10, 17, ...



The pattern here can be described as having a constant second difference of +2

66) A valid argument is one whose conclusion follows necessarily if you assume the truth of the premises. If one or more of the premises is untrue, the conclusion of the argument may or may not be true.

Likewise, an argument with true premises and a true conclusion may or may not be valid

Section 1.2

8a) $q \wedge p$

b) $(\sim p) \rightarrow (\sim q)$

c) $p \wedge (\sim q)$

d) $\sim (p \vee q)$

e) $(\sim q) \rightarrow (\sim p)$

f) $q \rightarrow p$

10a) $r \rightarrow q$

b) $(r \wedge q) \wedge (\sim p)$

c) $(\sim p) \rightarrow (\sim q)$

d) $r \wedge (\sim (q \vee p))$

e) $q \rightarrow (p \vee r)$

f) $(p \wedge (\sim q)) \rightarrow r$

12) b: a person is born in the US

c: a person is an American citizen

$$b \rightarrow c$$

14) f: a person is a convicted felon

v: a person is eligible to vote

$$f \rightarrow (\sim v)$$

Equivalent answer: $v \rightarrow (\sim f)$

36a) I am innocent and I have an alibi

b) If I am innocent, then I have an alibi

c) If I don't have an alibi, then I am not innocent

d) Either I have an alibi or I am not innocent

38a) If I am innocent or I have an alibi, then I don't go to jail

b) If I am innocent, but I don't have an alibi, then I go to jail

c) Either I am not innocent and I have an alibi, or I go to jail

d) If I am innocent and I go to jail, then I do not have an alibi

40) Statement #1 is more appropriate. We can see this more clearly by rephrasing each statement in if-then form.

1: If it rains, then it is cloudy

2: If it is cloudy, then it rains.

Statement 1 is more or less true, whereas statement 2 is certainly false.