Spring, 1992 Name: ____________________

CS 342 — Principles of Programming Languages

Prolog Test (Terms, Version 1)

The usual instructions apply.

Don't feel obligated to fill up all the space on the page. Conversely, don't feel limited by the space on the page, since you can use the back if you explicitly tell us on the front when you do so.

1 Terms

1. (8 points) Consider the following small Prolog program.

```
(infer (reverse nil nil))
(infer (reverse (cons X L) M) from (reverse L N) (addtoend N X M))
```

Identify (write down) one example of each of the following in the above program:

(a) a logical variable

(b) a ground term

(c) a functor

(d) a clause head

2. (10 points) Describe the logical interpretation (way to think about) of a Prolog program.

3. (10 points) Give all the output printed by the query and the tracing prints in the following Prolog program. If the program goes into an infinite loop show the two identical states, and write "infinite loop".

```
(infer (sum 0 X X)
  from (print sum base) (print x = X))
(infer (sum (s X) Y (s Z))
  from (print entering) (print x = X y = Y z = Z)
       (sum X Y Z)
       (print exiting) (print x = X y = Y z = Z))
(infer? (sum (s (s 0)) D (s (s (s (s 0))))) (print answer: D))
```