Principles of Programming, Fall 2009
Practice 1
Introduction of Scheme

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1. Below is a sequence of expressions. What is the result printed by the interpreter in response to each expression? Assume that the sequence is to be evaluated in the order in which it is presented.

```
10

(+ 5 3 4)

(+ (* 2 4) (- 4 6)

(define a 3)

(define b (+ a 1))

(+ a b (* a b))

(= a b)

(if (and (> b a) (< b (* a b)))
    b
    a)

(cond ((= a 4) 6)
      ((= b 4) (+ 6 7 a))
      (else 25))

(+ 2 (if (> b a) b a))

(* (cond ((> a b) a)
         ((< a b) b)
```

```
        (else -1))
   (+ a 1))

(define (f2c t) (* 5/9 (- t 32)))

(f2c -40)
(f2c 212)
```

2. Define a procedure *sign* that takes a number as its argument and returns 1 if the number is positive, -1 if the number is negative, and 0 if the number is 0.

3. Define a procedure called *abs* that takes a number as its argument and returns the absolute value of the number. For examples,

```
(abs -3)
3

(abs (- 4 6))
2
```

   Write two definitions of *abs* - one that uses *if* and one that uses *cond*.

4. Define a procedure called *biggest* that takes three numbers as arguments and returns the number which has biggest absolute value.

5. Define a procedure called *sqlt* that takes three numbers as arguments and returns the sum of the squares of the two larger numbers. For examples,

```
(sqlt 3 -1 2)
13
```