CSE 341 — General Programming Language Concepts — Mini Exercises — Answers

1. Consider the following example in an Algol-like language.

```
begin
integer n;
procedure p(k: integer);
    begin
    k := k+5;
    print(n);
    n := n+(2*k);
    end;
n := 0;
p(n);
print(n);
end;
```

   (a) What is the output when k is passed by value? **0 10**

   (b) What is the output when k is passed by value result? **0 5**

   (c) What is the output when k is passed by reference? **5 15**

2. True or false?

   (a) Haskell is statically typed if the programmer includes a type declaration for all functions; otherwise it is dynamically typed. **False**.

   (b) Java is type safe. **True**.

   (c) Each of the following Haskell expression gives a compile-time type error, since `tail` is being provided a value of the incorrect type:

```
tail []
tail (1,2,3)
```

   False. (Only the second gives a type error; the first one gives a runtime error.)

3. What happens when you try the following Haskell program?

```
x :: Float
y :: Double
x = 3
y = 4
z = x+y
```

   You get a type error, since + doesn't work with two different types (Double and Float). No coercion in Haskell, not even Float to Double. But note that Haskell isn't troubled by `x = 3`! That's ok because 3 has type `(Num t) => t`.