Name: _____

1. Put a "T" next to the statements below which are "true" (10 points)
   a. ___F___ In UNIX, a file must always have a "file type" (a dot, followed by a one to three character name such as ".txt" or ".c")
   b. ___T___ In UNIX, a file must always be in a directory.
   c. ___T___ In UNIX, the parent of a directory is always a directory (except for the "top" directory "/" which does not have a parent.)
   d. ___T___ In UNIX, the command "ls ~" always lists what is in your home directory, no matter what your current directory is.
   e. ___F___ The gcc command will always produce a binary file, even if there are compile errors in your code.

2. Given the following C code, what will get printed to standard output? (10 points)

   ```
   #include <stdio.h>
   int copyVal(int x) { return x; }
   int main(int argc, char **argv) {
           float v=3.7;
           printf("The value of v is %f\n",(float)copyVal(v));
           return 0;
   }
   ```

   The value of v is 3.000000

3. When writing C code, coders often put prototypes of functions at the top of the file, even though this prototype information is repeated when the function is defined lower in the file. Explain in one or two sentences why a programmer would repeat the function prototype information. (10 points)

   The prototype at the top of the file declares a function, and allows that function to be invoked before it is defined. The prototype enables "right-side-up" code – code in which the higher level functions are at the top of the file.

4. Put an X next to each expression which is a valid declaration of a variable. (10 points)

   __X__ int x=5;

   _____ char first_init@x='A'; // @ not allowed in identifier names

   _____ y = x + 3; // valid statement, but not a declaration

   __X__ char name=542; // name is misleading for a number, and 542 will get truncated

   _____ float while=3.25e8; // "while" is a keyword – not a valid identifier name

5. What is the value of the following C expressions, assuming int x=10; int y=7; float z=3.4; (20 points)

   __60_ x*6; // 10*6

   __24_ x+y*2; // 10 + (7*2)

   _27.0 x*z – y; // ((float)10*3.4) – (float)7

   104.0 x * (z + y); // (float)10 * (3.4 + float(7))

   __2_ x & y; // 0b 000... 1010 & 0b 000... 0111 = 0b000 ... 0010

6. Given the following C code, what result will get printed? (20 points)

   ```
   #include <stdio.h>
   int add(int x,int y) { return x+y; }
   int sub(int x,int y) { return x–y; }

   int main() {
           int a=3; int b=7; int c;
           c = sub(add(a,b),sub(b,a));
           printf("c is %d\n",c);
           return 0;
   }
   ```
   c is 6
   // add(a,b)=10, sub(b,a)=4, sub(10,4)=6

7. Write a C function called "poly" that will take a single integer parameter called "x", and return the integer value of $x^2 + 3x - 7$. (20 points)

   ```
   int poly(int x) {
           return (x*x) + (3*x) – 7;
   }
   ```