CSE 20211 – Exam 1 – Spring 2011 NAME:
NETID:

Evaluate each of the following expressions and determine the **type** and the **value**: (10 points)

Variables	**Expression**	**Type**	**Value**
int a = 10, b = 20;	a + b		
int a = 3; double b= 3.5;	a + b		
char c = 'f'; int b = 4;	a + b		
float f = 5.0; int w = 3, z=5;	f + w / z;		
int d=5, e=4;	d – e ++		
int d = 5, e = 4;	--d + e		
int a=1, b=2, c=3, t=0	(short)a + (long)b + c * cos (t)		
int a=10, x=20, y=30;	a * (x < y)		
int x = 16; double y=3.5, z= 5.4	(x/3 > 5) ? y : z		
int t=5;	(t * 13) % 3		

For each of the code fragments below, write what the program displays in the box to the right. Unless otherwise specified, assume that all variables are integers. (10 points)

`for(i=0;i<7;i++) {`
`  for(j=0;j<i;j++) {`
`  printf("#");`
`  }`
`  printf("\n");`
`}`	

`for(i=50;;i++) {`
`  if(i<60) continue;`
`  if(i%7==0) break;`
`  printf("%d\n",i);`
`}`	

`int x=0, y=0, flip=0;`
`do {`
`  if(flip==1) {`
`  nx = x + 10;`
`  } else {`
`  ny = y + 10;`
`  }`
`  gfx_line(x,y,nx,ny);`
`  x = nx;`
`  y = ny;`
`  flip = 1 - flip;`
`} while( x<50 );`	

`int z = 9035768;`
`int u = 1;`
`int c, d;`
 	
`while(1) {`
`  int c = z / u;`
`  int d = c % 10;`
`  if(c==0) break;`
`  printf("%d",d);`
`  if(u==100) printf("-");`
`  u = u*10;`
`}`
`printf("\n");`	

For each of the following questions, write a **function** that computes the desired result. A good answer can fit in the available space, but use the back of the page if necessary.

Write a **function** that determines if an integer parameter is a prime number.
The function should return true if it is prime, and false if it is not. (5 points)

Write a **function** that returns the following approximation for a parameter x. (5 points)

$$\log(x) = (x-1) - \frac{(x-1)^2}{2} + \frac{(x-1)^3}{3} - \ \ldots$$

Suppose that you have a deck of unusual cards. The cards are numbered 1-9 and J for a “joker”. There are three of each kind of card, for a total of thirty cards. Each card is worth its face value in points, except the joker is worth negative 10 points. So, the hand 8, 5, J, 3 would be worth 6 points.

Write a **program** that asks the user to enter a particular score, then prints out all possible hands of four cards drawn from one deck with that score. (Don’t forget there are only three of each kind of card!) A good answer can fit in the space available. (10 points)