Name: _____

1. (25 points) Assume that i, j are integers, and p, q are pointers. Which of the following will compile?

   (a) `p = i + j;`

   Solution: Will not compile.

   (b) `p = &(i + j);`

   Solution: Will not compile.

   (c) `p = &j;`

   Solution: Will compile.

   (d) `p = q;`

   Solution: Will compile.

   (e) `i = *q;`

   Solution: Will compile.

   (f) `i = &q;`

   Solution: Will not compile.

2. (25 points) What three properties does a recursive function have?

   (a)

   Solution: A recursive function calls itself.

   (b)

   Solution: A recursive function has a base case.

   (c)

   Solution: A recursive function always reaches a base case.

3. (25 points) Which of the following are valid `lvalues`?

   (a) `x`

   Solution: lvalue

   (b) `i + j`

   Solution: rvalue

   (c) `foo(x)`

   Solution: lvalue

   (d) `*x`

   Solution: lvalue

   (e) `&x`

   Solution: rvalue

4. (25 points) On the back of this paper, write a recursive Fibonacci function in C++, where the Fibonacci function is defined as

$$f(0) = 0$$
$$f(1) = 1$$
$$f(n) = f(n-1) + f(n-2)$$

Solution:

```
int fibonacci(int n) {
    if (n == 0) return 0;
    if (n == 1) return 1;
    return fibonacci(n - 1) + fibonacci(n - 2);
}
```