Pointer practice - Self-test exercises from Savitch chapter 10

1. What is a pointer in C++?
2. Give at least three uses of the * operator. Name and describe each use.
3. What is the output produced by the following code?

```
int *p1, *p2;
p1 = new int;
p2 = new int;
*p1 = 10;
*p2 = 20;
cout << *p1 << " " << *p2 << endl;
p1 = p2;
cout << *p1 << " " << *p2 << endl;
*p1 = 30;
cout << *p1 << " " << *p2 << endl;
```

   How would the output change if you were to replace
   `*p1 = 30;`
   with the following?
   `*p2 = 30;`

4. What is the output produced by the following code?

```
int *p1, *p2;
p1 = new int;
p2 = new int;
*p1 = 10;
*p2 = 20;
cout << *p1 << " " << *p2 << endl;
*p1 = *p2; //This is different from Exercise 3
cout << *p1 << " " << *p2 << endl;
*p1 = 30;
cout << *p1 << " " << *p2 << endl;
```

   What unfortunate misinterpretation can occur with the following declaration?
   `int* intPtr1, intPtr2;`

5. Suppose a dynamic variable were created as follows:

```
char *p;
p = new char;
```

   Assuming that the value of the pointer variable p has not changed (so it still points to the same dynamic variable), how can you destroy this new dynamic variable and return the memory it uses to the freestore manager so that the memory can be reused to create other new dynamic variables?

6. Describe the action of the new operator. What does the `new` operator return? What are the indications of errors?

7. Suppose your program contains code to create a dynamically allocated array as follows:

```
int *entry;
entry = new int[10];
```

   so that the pointer variable entry is pointing to this dynamically allocated array.
   Write code to fill this array with ten numbers typed in at the keyboard.

9. Suppose your program contains code to create a dynamically allocated array as in Ex 10, and suppose the pointer variable entry has not had its (pointer) value changed. Write code to destroy this dynamically allocated array and return the memory it uses to the freestore manager.