Problem 1:

Top-down programming builds the whole application at once, breaking the problem into chunks, and each chunk into smaller chunks, until it is manageable to accomplish; bottom-up programming builds the functional parts, which connect together to accomplish the end goal.

Problem 2:

A). Class – a user defined data type which can control how its data is accessed / modified

B). Object – an instance of a class

C). Creating a reference to an object but not linked yet – creating an object variable but not assigning it to a new object.

D). Object creation – create a new object with the new keyword.

E). Data members/attributes/properties/instance variable – variables stored within a class.

F). Methods/member function/actions/behavior – methods stored within a class

G). Encapsulation – The act of controlling access or modification of data by using a class

H). Making two reference variables or class instances pointing to the same object memory – Having two variables point to the same object

I). Constructors and their types – A constructor is a special type of method which is used to initialize a class, it has the same name as the class and starts with a capital letter, they can be public, private, or protected, and can have no-args or be parameterized, or the default can be used (no-arg, does nothing).

J). Constructor overloading – Constructors can be overloaded just like methods, this means that multiple constructors (with the same name of course) but they have different arguments.

K). Polymorphism with constructors. – Polymorphism allows for children classes to inherit attributes from their parent classes, this can be done with method / constructor overloading.

```
a = 0.0 b = 1.0 c = 0.0
product d = 1.0
a = 0.0 b = 1.0 c = 0.0
product d = 1.0
a = 10.0 b = 10.0 c = 10.0
product d = 10.0
a = 1.0 b = 2.0 c = 3.0
product d = 4.0
a = 1.0 b = 2.0 c = 3.0
product d = 4.0
a = 0.0 b = 1.0 c = 0.0
product d = 0.0
a = 0.0 b = 1.0 c = 0.0
product d = 0.0
a = 10.0 b = 10.0 c = 10.0
product d = 1000.0
a = 1.0 b = 2.0 c = 3.0
product d = 6.0
a = 1.0 b = 2.0 c = 3.0
product d = 6.0
```