

14.1 What is the difference between an instance member variable and a static member variable?

An instance member variable is stored with object instances and affects their size. A static member variable is stored with the class definition and is accessible by all instances. Think of it like a global variable scoped to a class.

14.2 Static member variables are declared inside the class declaration. Where are static member variables defined?

They are defined outside the class, or else the language implicitly defines them to be zero.

14.3 Does a static member variable come into existence in memory before, at the same time as, or after any instances of its class?

Before.

14.4 What limitation does a static member function have?

It cannot access any non-static member of a class.

14.5 What action is possible with a static member function that isn't possible with an instance member function?

They can access class-static member variables before any instances of that class have been created. (This is allegedly to allow for the creation of very specialized systems).

14.6 If a class X declares function f as a friend, does function f become a member of class X?

No, although it is treated "as if" it were. Specifically, it isn't associated with the class's function table, and it needs to scope class member accesses appropriately.

14.7 Class Y is a friend of class X, which means the member functions of class Y have access to the private members of class X. Does the friend key word appear in class Y's declaration or in class X's declaration?

The friend keyword should appear in class X's declaration.

44. FALSE

45. TRUE

46. FALSE

47. FALSE

48. TRUE

49. TRUE

50. TRUE

51. C++ requires a type specifier for all declarations, so the first constructor does not work. The copy constructor must pass its first argument by reference.

60. The overloaded operator should have been overloaded as `operator=`, not `Circle=`. Right now Clang complains of some cryptic “incomplete field” problem, which probably means it got interpreted as a member variable with some wonky initializer list.