

Semantic difference - any reasonable “semantic” difference works

For example,

- a. reference is just an alias for an “already existing” object, while pointer points to a certain object.
- b. A pointer can be re-assigned, A reference cannot be re-bound, and must be bound at initialization.
- c. A pointer variable has its own identity: a distinct, visible memory address that can be taken with the unary & operator and a certain amount of space that can be measured with the sizeof operator. Using those operators on a reference returns a value corresponding to whatever the reference is bound to; the reference’s own address and size are invisible.
- d. You can have arbitrarily nested pointers to pointers offering extra levels of indirection. References only offer one level of indirection because references to references collapse.
- e. A pointer can be assigned nullptr, whereas a reference must be bound to an existing object. If you try hard enough, you can bind a reference to nullptr, but this is undefined and will not behave consistently.
- f. Const references and rvalue references can be bound to temporaries (see temporary materialization). Pointers cannot (not without some indirection):

```
const int &x = int(12); // legal C++
```

```
int *y = &int(12); // illegal to take the address of a temporary.
```

Any of these could also work for when one is preferable over another if the correct explanation is also offered. No marks without explanation. For example - “Pointers are used in linked lists while references are used in functions” is NOT a valid answer - if explanation is given then it is fine.