The Java program below has been written by someone new to list-processing. This test program is intended to set up a list whose elements are 4, 7 and 11.

```java
public class ListTest {
    public static void main(String[] args) {
        Link start = null;
        start.put(4); start.put(7); start.put(11);
        System.out.println("List elements: "+ start);
    }
}

class Link {
    private int val;
    private Link next;

    public Link(int n) {
        this.val = n;
        this.next = null;
    }

    public void put(int k) {
        if (this == null) {
            this = new Link(k); // Error noted here
        } else {
            this.next.put(k);
        }
    }

    public String toString() {
        return (this == null ? "" : " " + this.next.toString());
    }
}
```

The Java compiler gives a single error message, complaining about the statement indicated. What is the problem? Explain why there is more to fixing the program than merely changing this statement. [5 marks]

Making the minimum number of changes, modify the program so that it works approximately in the way the author intended. [6 marks]

Provide for class `Link` a method `sum()` which returns the sum of the elements in the list. [3 marks]

Provide for class `Link` a method `reverse()` which returns a new list whose elements are in the reverse order of those in the original list. [6 marks]