

```

01  /*@ modifies this.theArray[*], this.topOfStack, this.theArray[this.topOfStack], this.theArray[this.topOfStack-1]; */
02  /*@ ensures (\result != null) == (\old(this.topOfStack) >= 0); */
03  /*@ ensures (\result != null) ==> (\old(this.theArray[this.topOfStack]) != null); */
04  /*@ ensures (\result != null) ==> (!(\forallall int i; (0 <= i && i <= \old(this.theArray.length-1)) ==> (\old(\typeof(this.theArray[i]) != \typeof(\result))))); */
05  /*@ ensures (\result != null) ==> (\typeof(this.theArray) != \typeof(\result)); */
06  /*@ ensures (\result != null) ==> (this.theArray[\old(this.topOfStack)] == null); */
07  /*@ ensures (\result != null) ==> (this.topOfStack - \old(this.topOfStack) + 1 == 0); */
08  /*@ ensures (\result != null) ==> (this.topOfStack < this.theArray.length-1); */
09  /*@ ensures (\result == null) == (\old(this.topOfStack) == -1); */
10  /*@ ensures (\result == null) == (this.topOfStack == \old(this.topOfStack)); */
11  /*@ ensures (\result == null) ==> ((\forallall int i; (0 <= i && i <= \old(this.theArray.length-1)) ==> (\old(this.theArray[i] == null)))); */
12  /*@ ensures (\result == null) ==> ((\forallall int i; (0 <= i && i <= \old(this.theArray.length-1)) ==> (\old(\typeof(this.theArray[i]) == \typeof(null)))); */
13  /*@ ensures (\result == null) ==> ((\forallall int i; (0 <= i && i <= this.theArray.length-1) ==> (this.theArray[i] == null)); */
14  /*@ ensures (\result == null) ==> ((\forallall int i; (0 <= i && i <= this.theArray.length-1) ==> (\typeof(this.theArray[i]) == \typeof(null)))); */
15  /*@ ensures (\result == null) ==> (this.topOfStack == -1); */
16  /*@ ensures \typeof(this.theArray) != \typeof(\result); */
17  /*@ ensures this.topOfStack <= \old(this.topOfStack); */
18  /*@ ensures !(\forallall int i; (0 <= i && i <= \old(this.theArray.length-1)) ==> (\old(\typeof(this.theArray[i]) != \typeof(\result))))); */
19  /*@ ensures \old(this.topOfStack) <= this.theArray.length-1; */
20  /**
21   * Return and remove most recently inserted item from the stack.
22   * @return most recently inserted item, or null, if stack is empty.
23   */
24  public Object topAndPop()
25  {
26      if( isEmpty() )
27          return null;
28      Object topItem = top();
29      theArray[ topOfStack-- ] = null;
30      return topItem;
31  }

```