

11.9

1. (a) No simple case
(b) Arguments *larger* on each call
3. (a) 1, 2, 3, 4, 6, 9

11.10

1. Answers may vary
2. Answers may vary
3. (a) $f(x, y)$ calculates $x \times y$
for non-negative x, y
4. (b) 9
(d) Non-recursive version should be;
it can avoid repetitive calls
6. (a)

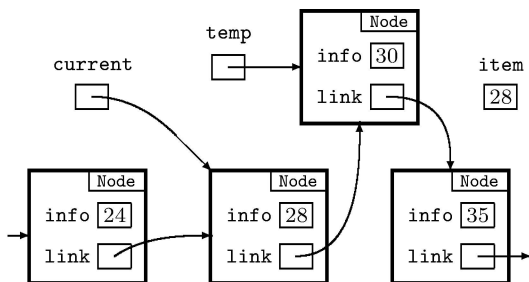
```
if n >= 1
    print a row of n asterisks
    print an (n-1) pattern
    print a row of n asterisks
```
7. (a) $T_2(x) = x^2 - 1$
 $T_3(x) = x^3 - 2x$
(b) 5
8. (a) i) $((x^2)^2 \times x)^2$
ii) $((((x^2) \times x)^2)^2 \times x)$
iii) $(((((x^2) \times x)^2)^2 \times x)^2)^2$
(b) 4, 6, and 8

12.1

1. B: ref.link
C: ref.link.link
D: ref.link.link.info

12.2

- 1.



3. No, we cannot jump to the middle of a linked list as we can with an array

12.3

1. Answers may vary
4. Insertion, yes; deletion, no
5. (a) 123, 132, 213, 231, 321
(b) 1234, 1243, 1324, 1342, 1432,
2134, 2143, 2314, 2341, 2431,
3214, 3241, 3421, 4321

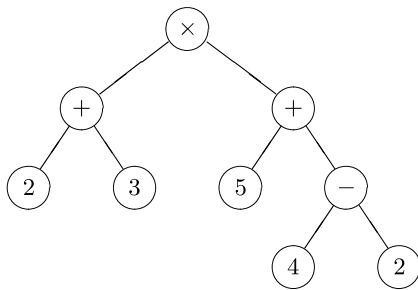
12.4

1. Reverse the order of printing
2. If head is null, an exception is thrown by: `item < head.info`
3. To INSERT IN TAIL OF A NON-EMPTY LIST
if tail empty or item precedes tail
insert as second node of list
else INSERT IN TAIL OF NON-EMPTY TAIL

12.5

1. (a) A
(b) H, E, I, J, and K
(c) B, D, E, and H
(d) F and G
(e) B-C or D-E or F-G or J-K
(f) F and I
(g) A
(h) D
2. (a) 15 52 28 32 64 20 26 39 35
(b) 15 28 32 52 20 26 35 39 64
(c) 64 52 15 32 28 39 26 20 35
3. (a) 22
(b) i. $+ \div 8 2 - \times 3 8 6$
ii. $8 \div 2 + 3 \times 8 - 6$
iii. $8 2 \div 3 8 \times 6 - +$

(c)



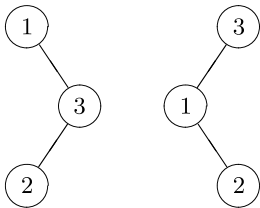
12.7

1. It fails if the list is empty

12.8

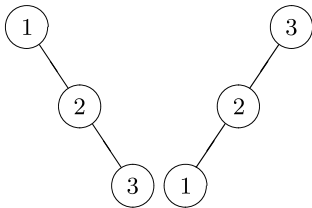
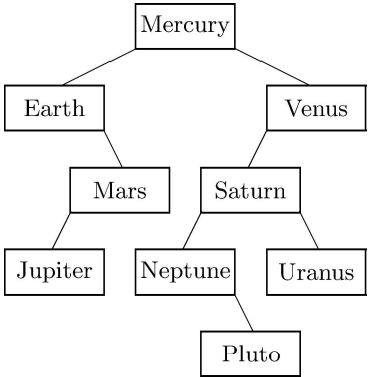
1. It reverses a list
2. (a) A B D E H I C F G
(b) D B H E I A F C G
(c) D H I E B F G C A

4. (b) The method returns zero
(c) One is called with a **Tree** object the other with a **Node** object
- 3.

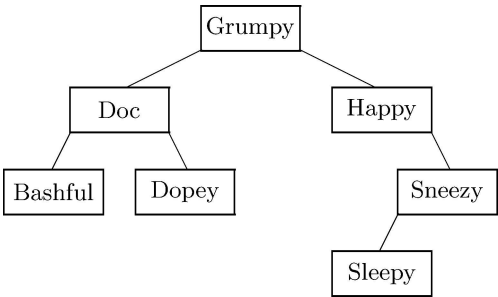


12.6

1. Replace "...all less than ..." by "...all less than or equal to ..."
2. (a) Humie, Philip, Mary, Michael
(b) Humie, Angela, Dan, Betsy
(c) Humie, Philip, Mary, Michael
(d) Humie, Angela, Dan, Dennis
3. (a) left child of Mary
(b) left child of Thomas
- 4.



4.



5. (a) It would be inserted in right subtree of item already in tree