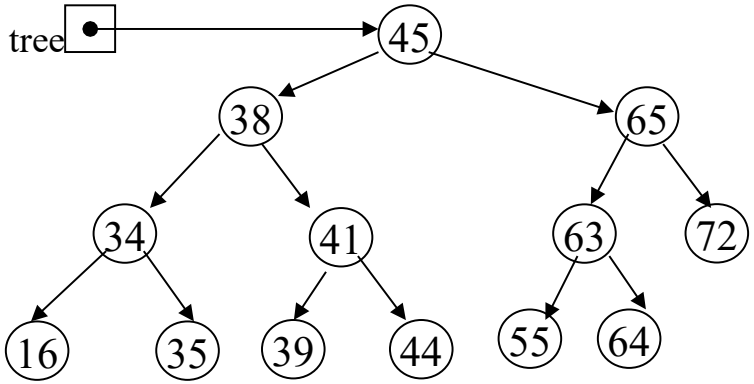
1. Given the following binary tree:



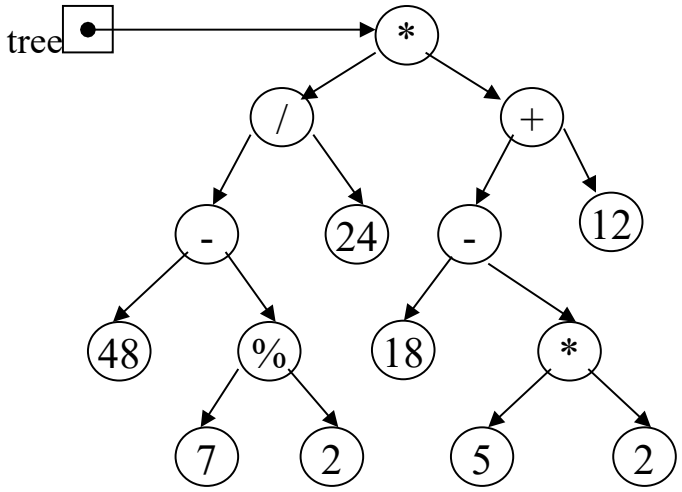

(a) What is the inorder traversal of the tree?
16, 34, 35, 38, 39, 41, 44, 45, 55, 63, 64, 65, 72

(b) What is the preorder traversal of the tree?
45, 38, 34, 16, 35, 41, 39, 44, 65, 63, 55, 64, 72

(c) What is the postorder traversal of the tree?
16, 35, 34, 39, 44, 41, 38, 55, 64, 63, 72, 65, 45

d) What is the height of the tree? What nodes are on level 2?
- Height = 3, Level 2 = 38 and 65

2. Given the following binary expression tree:




a) What is the inorder traversal of the tree?
48, -, %, 7, 2, /, 24, *, 18, -, 5, *, 2, +, 12

(b) What is the postorder traversal of the tree?
48, 7, 2, %, -, 24, /, 18, 5, 2, *, -, 12, +, *

c) What does it evaluate to if using integer division?
20

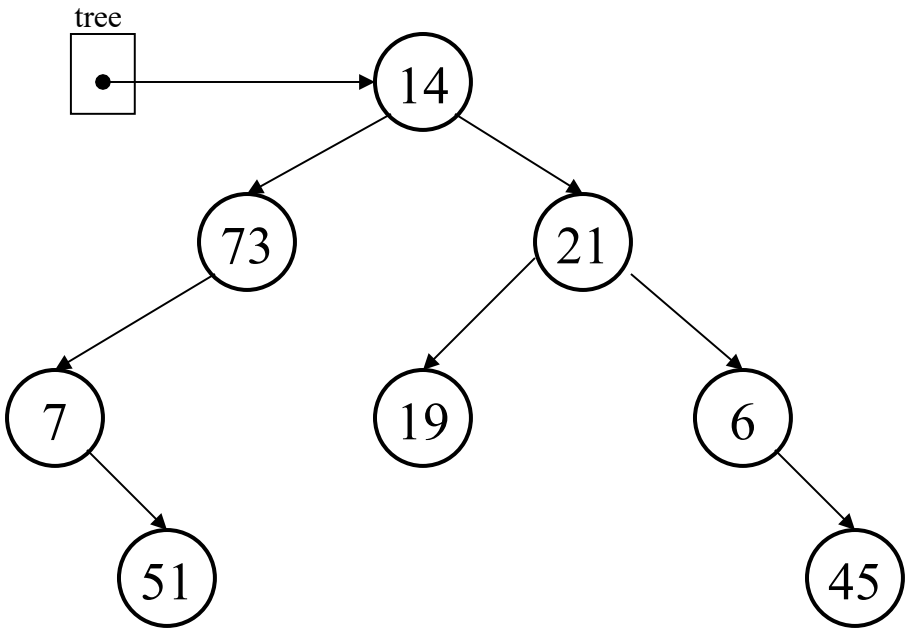
d) What does it evaluate to if using float division?
39.166

3. The elements in a binary tree area to be stored in an array. Each element is a nonnegative int value.

a. What value can you use as a dummy value, if the binary tree is not complete? _null_

b. Show the contents of the array, given the tree illustrated below

| | |
|---|---|
| [0] | 14 |
| [1] | 73 |
| [2] | 21 |
| [3] | 7 |
| [4] | null |
| [5] | 19 |
| [6] | 6 |
| [7] | null |
| [8] | 51 |
| [9] | null |
| [10] | null |
| [11] | null |
| [12] | null |
| [13] | null |
| [14] | 45 |



4. Given the array pictured below, draw the binary tree that can be created from its elements.

| | |
|---|---|
| [0] | 35 |
| [1] | 20 |
| [2] | 71 |
| [3] | 40 |
| [4] | 52 |
| [5] | 63 |
| [6] | null |
| [7] | 17 |
| [8] | 25 |
| [9] | null |
| [10] | 7 |
| [11] | null |
| [12] | 45 |