

# MTH 325 Mini-Quiz 1

This quiz contains new versions of content standards T.1, T.2, and T.3.

- As always, work only the problems you **need to work** and **feel ready to work**.
- For this mini-quiz you will do **all of your work on paper**. Please use your own paper (or paper provided) for this. You can put more than one problem on a page, but please label each content standard, and *put the problems in order* with T.1 coming before T.2 and T.2 before T.3.
- You are not allowed to use any technology on this mini-quiz other than a handheld calculator.
- When you are done, **make sure your name is on your work** and hand in your paper to the instructor (or proctor). You will not be scanning or uploading anything to Blackboard this time.
- Your work must be handed in before the end of the class session. No extensions are available.

## Content Skill Standard T.1

T.1: I can determine whether a description of a graph (list of vertex and edge sets, degree sequence, a drawing, or list of properties) represents a tree.

Each part below states a specific condition on a graph  $G$ . For each case, determine if the graph *must* be a tree, *might or might not* be a tree, or *cannot* be a tree.

If the graph *must* be a tree or *cannot* be a tree, give a specific, clear, and correct explanation of why (that does not merely state the definition of a tree). If the graph *might or might not* be a tree, give a concrete, specific example of a graph that is a tree that satisfies the conditions given and a concrete, specific example of a graph that is not a tree that satisfies the conditions.

1.  $G$  is a graph with 4 vertices and 3 edges
2.  $G$  is a graph that has an Euler cycle
3.  $G$  is a graph whose degree sequence is 3, 2, 2, 1, 1, 1

## Content Skill Standard T.2

T.2: Given a list with a total ordering, I can construct the binary search tree.

Consider this list of words:

1 minor    2 sneeze    3 charge    4 many    5 pig    6 cagey    7 vague  
8 remove    9 enjoy    10 knot    11 control    12 cultured

NOTE: This is an ordered list, where the number before each word gives its position in the list.

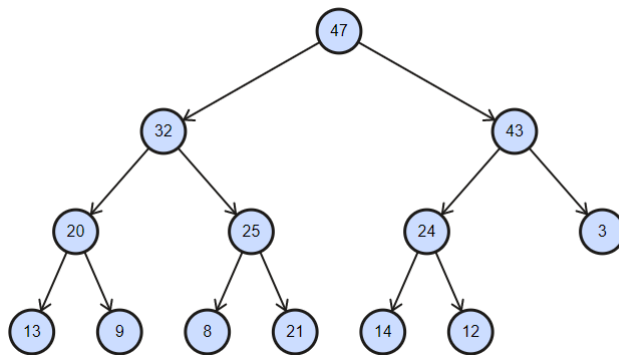
Using alphabetical/lexicographic ordering, construct a binary search tree for this list.

**Success criteria:** The binary search tree is completely correct.

## Content Skill Standard T.3

T.3: I can list the vertices of a tree in the order they are visited using preorder, inorder, and postorder traversals.

Consider the tree:



(Note: This is a binary tree, but not a binary search tree.) List the vertices that are visited, in the proper order when done using:

1. A preorder traversal
2. An inorder traversal
3. A postorder traversal

Please **number your answers correctly**: the preorder traversal in part 1, the inorder in part 2, the postorder in part 3. If the answers are not numbered or otherwise labelled, I'll assume the first list is preorder, second is inorder, and the third is postorder.

**Success criteria:** Each list is in the correct order relative to the traversal that is being done. Up to two mistakes are allowed; mistakes that result from prior mistakes are counted separately.