CS302 - Assignment 9

Due: Thursday, Mar. 15 at the beginning of class

Hand-in method: paper

http://www.smbc-comics.com/index.php?db=comics&id=1872
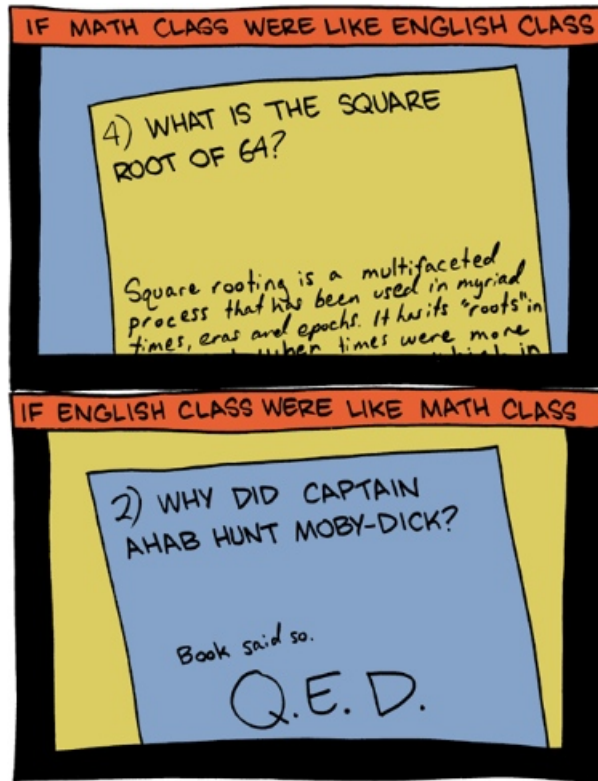
1. [**1 point**] What is one things that you'd like to see reviewed in the class next Tuesday ("nothing" is an acceptable answer)?

2. [**7 points**] In a binary search tree, we might also keep track of the total number of nodes in that subtree (including the node itself).

   (a) [**5 points**] Assuming we store this value (e.g. $x.keys$) write pseudocode for a function BSTKEYLESSTHAN(T, k) that takes a tree T and a number k and returns the number of keys in T that are less than k.

   (b) [**2 points**] What is the best-case and worst-case running time of your algorithm?

3. [**5 points**] Is the operation of deletion "commutative" in that deleting x and then y from a binary search tree always leaves the same tree as deleting y and then x? Argue why it is or give a counterexample.

4. [**3 points**] Given the B-Tree below with $t = 2$, draw the tree that results after inserting 'P',
'A', 'B':

```
          Q
       /     \
     FK        T
    / | \     | \
   C  H  LMN  RS  VW
```