



Growing Mature Arboreal Trees  
Oak Grove Avenue  
Pinneapolis, PU 22222  
September 17, 2014

Calculus Student  
Brigham Young University  
Provo, UT 84602

Dear Calculus Student:

I am desperate for help, and am in agony because I think no one but you can save me from this horrible mess. Indeed, it may be that even you can not save me—that I am entirely done for—but I'm pleading with you in spite of it all. Please, please help me. I don't know where else to turn.

The trouble all began—although I didn't know it then—about five years ago when my company hired Jack Phaze. Jack was a real toady, always sucking up to the company owner, Mabel Sabbling, and sneering at the rest of us. It wasn't long before most of us called him “Jerk Face” behind his back—you never met a guy less willing to do an honest day's work, or more willing to take credit for work done by others.

It wasn't too long either before Jack surprised us by getting promoted into a position of importance. I guess I should back up and explain what our company does. The “Growing Mature Arboreal Trees” Company (or as it is popularly known, “GMA Tree”) cultivates exotic trees for use in bird sanctuaries and movie sets. As you can imagine, there's very little demand for this kind of thing, so we have a small business with few competitors. If I lose this job where I've worked all my life, there's not anywhere else I can go. I know exotic trees—that's all!

About a year ago, Jack finally was promoted to working directly beneath me, to my great chagrin. The morale of all the people in my group went down, absenteeism went up, and I'm sure it was all because of how miserable it is to work with Jack. One day I actually pulled aside a group of my employees to ask them what was bothering them, and they confirmed my suspicions: Jack never did what he was supposed to, and everyone else ended up covering for him just to get the projects done. Then, after they'd covered his rear end, he'd sneer at them for how hard they worked. I was very angry, as you could imagine, and I told them, “If I have anything to do with it, Jerk Face is out of here.”

Wouldn't you know it, right at that moment he walked around the corner—I could tell he'd heard me by the look on his face. We've been out for each other's blood ever since.

I had a harder time getting rid of him than you might imagine. It turns out that Phaze has an uncle in the bird sanctuary business (clearly the secret of his longevity in our company).

Well, shortly after the “Jerk Face” incident, I had a visit from a herbicide specialist that Mabel Sabbling (the company owner) wanted me to talk with. Edgar (I don't remember his last name, but I wish I did!) convinced me that we could build a greenhouse which protected

trees from insects and disease. He showed me a bunch of figures, enough to convince me to commit our company to eventually purchase such a greenhouse. Then, just two days after I signed the contract, he told me he's been hired by a bird sanctuary and was being sent to Costa Rica. I haven't been able to get his forwarding address from his new company, so I can no longer ask for his help. I smell Jack behind all this!

Here's the problem. Our company can only commit \$4225 to this project without going into debt. Also, since the greenhouse can only hold so many trees, we need to make sure that we're spending no more than \$100 per tree—otherwise we'll operate at a loss. Ed assured me this was possible—he even showed me how to do it—but he took most of his notes with him, and I'm no mathematical genius.

Here's how the expenses add up. First, to build a greenhouse, you need \$2,222 just in start up costs. Then, for each tree in the green house, you need \$5 for a proper planter. But in addition, because the more trees there are, the easier it is to spread infection, the cost of disinfecting any one tree is \$1 for each tree in the greenhouse.

The one example Edgar did that I managed to save goes like this: suppose we plant 10 trees. Then we'd spend \$2222 for the greenhouse, plus \$50 for planters, plus \$10 to disinfect each of 10 trees (meaning \$100 for disinfecting the whole greenhouse). The total cost would be \$2,372. So far, so good. But unfortunately this comes to over \$237 per tree—that's bad.

I tried figuring out what happens if we increase the number of trees, say to 100. In that case, I got the cost per tree to be a better (but still not acceptable) \$127, but the total cost to be an exorbitant \$12,722. I'm not even sure these figures are right, however. I'm sure you could tell me.

I showed these figures to Sabbling, and she threw a fit—swore I'm going to wreck the company. She gave me two weeks to come up with a way to make this work, or I will be out of a job. I just know Jack is licking his lips over all this, waiting to take my place.

Can you help me figure out what to do? I'm sure that Ed was sincere, just as sure I am that Jack is a duplicitous, two-faced, no good scoundrel. I have until October 1 to get on track with Sabbling (that's when the contract I signed says we have to place our order with the company).

Yours most sincerely,

George Bush<sup>1</sup>

Associate Vice President for DisInfection

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<sup>1</sup>This letter was originally written by Annalisa Crannell of Franklin and Marshall College, and was obtained from the website <https://edisk.fandm.edu/annalisa.crannell/writing.in.math/index.html>. It has been slightly modified for the purposes of this project. The clip art in the letterhead was downloaded from <http://all-free-download.com>.