

The Schilling School for Gifted Children

Dr. Frank's class

Applied Science and Engineering/Calculus

Assignment given: 9/16/2008

Assignment due: 9/23/2008

SAILING OUT TO SEA

I was standing on the shore, watching my friend sailing out to sea in a boat with a tall mast. I waved goodbye until I couldn't see him anymore and I wondered how far away he was when I couldn't see the top of the mast anymore.

Your Tasks:

- 1) Derive a general equation which describes this situation;
- 2) Try the equation with some reasonable numbers;
- 3) Prepare an Excel spreadsheet and prepare two graphs:
 - a) Portion of mast visible vs. ship distance;
 - b) Mast height vs. disappearing distance;
- 4) Design a realistic experiment (one you could do at school) to test your equation;
- 5) Bring your experiment to class and demonstrate the validity of your equations.