## Name

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- You may work with other students in our class. However each student should write up solutions separately and independently - nobody should copy someone else's work.
- You may use your notes, the textbook, and past homework / worksheets.
- You may use a calculator only for basic arithmetic. In particular you should not use its graphing features.
- You are not allowed to search the internet, use wolfram|alpha, or use technology for anything beyond what is stated above.
- The quiz is due at the beginning of class on Friday, 17 October by 9:05am.
- There is a higher expectation for the quality of your work on a take-home quiz. Everything should be written logically and legibly with sufficient work to justify each answer. Blank copies of the quiz are available on the course webpage.
- Be sure that the pages are nicely stapled - do not just fold the corners.
- I will tell the TAs in the tutoring room that they are not allowed to help you on this quiz, so don't even try to ask them for help.

1. (5 points) Water is being poured at a rate of $8 \mathrm{ft}^{3} / \mathrm{min}$ into a cone-shaped tank, 20 ft deep and 10 ft in diameter at the top. Water is also leaking out of the bottom of the tank at an unknown constant rate. If the water level is rising at a rate of $\frac{1}{3} \mathrm{ft} / \mathrm{min}$ when the water is 16 ft deep, how fast is the water leaking?
2. (5 points) A rectangular field is to be fenced off along the bank of a river where no fence is required along the bank. If the material for the fence costs $\$ 12$ per foot for the two ends and $\$ 18$ per foot for the side parallel to the river, find the dimensions of the field of largest possible area that can be enclosed with $\$ 5400$ worth of fence.
