

## Homework 5 - Math 105

Name: \_\_\_\_\_

*Do not use a calculator unless it says (Calc) next to the problem.*

1. There are two cell phone companies that offer different packages. Company A charges a monthly service fee of \$34 plus \$.05/min talk-time. Company B charges a monthly service fee of \$40 plus \$.04/min talk-time.

(a) For each company, write a linear equation that models the total monthly cost  $C$  as a function of talk-time  $t$ .

(b) When is Company A's plan a better deal? When is Company B's plan better? Where, exactly, is the point where the two plans are equally good?

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2. It takes Andrew 30 minutes to drive to work in the morning. He drives home using the same route, but it takes 10 min longer, and he drives 10 mph slower (on average) than in the morning. How far does Andrew drive to work?

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3. Pressure increases linearly as you go deeper underwater. The pressure at the surface is 1 atmosphere (atm), and it increases by 1 atm every 10 meters deeper you get. Find the function for pressure  $P$  as a function of depth  $y$  underwater. What is the slope?
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4. Find a formula for the line that passes through the points  $(3, 5)$  and  $(6, -4)$ .

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5. **(Calc)** Alan and Ben are running for class president. Of the first 80% of the ballots that are counted, Ben receives 53% of the votes and Alan receives 47%. At least what percentage of the remaining votes must Alan receive to catch up to Ben in the election?

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6. A marine biologist tags 50 fish in one lake and releases them. Five days later, he captures 60 fish, of which 3 have already been tagged. Assuming that the number of fish in the lake is constant, and that 3 out of 60 is an accurate estimate for the proportion of fish in the lake that are tagged, how many fish are there in the lake?

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7. Sketch a graph of the line  $4x + 3y = 12$ . Be sure to label the graph and include the intercepts of the line.
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