

12. A tank has ten gallons of water in which two pounds of salt has been dissolved. Brine with 1.5 pound of salt per gallon enters at three gallons per minute, and the well-stirred mixture is drained out at a rate of  $x$  gallons per minute. Find the amount of salt in the tank at any time, given that
- (a)  $x = 3$       (b)  $x = 4$       (c)  $x = 2$ .
13. At the beginning of the year, you have \$10,000 on your account. Assuming you get 12% interest at the end of the year, how much money do you have at the end of the year? If you get twice 6% (after half a year, and then at the end of the year), how much money do you have finally? How about three times 4%? And four times 3%? And six times 2%? And twelve times 1%? And 360 times  $1/30\%$ ? What do you observe about the results? Is there an upper bound if we make the time intervals even smaller? If so, what is the upper bound?
14. Exam #1 will be on Friday, September 19. To get ready for this exam, work through all of the problems 1–13 and in addition through the supplementary homework problems for Chapters 1–2: 1, 3 of Section 1.1; 1 of Section 1.2; 1-8, 14, 15, 17, 19, 21, 25, 26 of Section 1.3; 1, 3, 4, 13–17, 21, 26, 29 of Section 2.1; 1, 4–8, 9, 11, 19, 25 of Section 2.2; 1, 4, 6, 7, 9, 14, 15, 18, 19, 24 of Section 2.3; 1, 4, 11, 17, 23 of Section 2.4; 2, 3, 7, 9, 15, 20 of Section 2.5.