Problems

Estimate the following addition and subtraction problems by rounding each number to the nearest thousand, then to the nearest hundred.

1. 3764 + 4668

2. 9661 + 7075

3. 9613 – 1252

4. 5253 – 3741

Estimate the grocery total by rounding each number up or down to the nearest half dollar.

5.	**6.**	**7.**
5.24	0.87	0.78
0.42	2.65	1.86
2.79	0.20	0.68
3.15	1.51	2.73
0.28	0.95	4.29
0.92	2.59	3.47
4.39	1.60	2.65

What are the possible numbers of digits in the answers to the following problems?

8. 5 digits times 3 digits

9. 5 digits divided by 3 digits

10. 8 digits times 4 digits

11. 8 digits divided by 4 digits

For the following problems, determine the possible number of digits in the answers. (Some answers may allow two possibilities.) A number written as 3abc represents a 4-digit number with a leading digit of 3.

12. $3abc \times 7def$

13. $8abc \times 1def$

14. $2abc \times 2def$

15. $9abc \div 5de$

16. $1abcdef \div 3ghij$

17. $27abcdefg \div 26hijk$

18. If a year has about 32 million seconds, then 1 trillion seconds is about how many years?

19. The government wants to buy a new weapons system costing $11 billion. The U.S. has about 100,000 public schools. If each school decides to hold a bake sale to raise money for the new weapons system, then about how much money does each school need to raise?

20. If an article is sent to two independent reviewers, and one reviewer finds 40 typos, the other finds 5 typos, and there were 2 typos in common, then estimate the total number of typos in the document.

21. Estimate 6% sales tax on a new car costing $31,500. Adjust your answer for 6.25% sales tax.

22. To calculate 8.5% tax, you can take 8% tax, then add the tax you just computed divided by what number? For 8.75% tax, you can take 9% tax, then subtract that tax divided by what number?

23. If money earns interest compounded at a rate of 2% per year, then about how many years would it take for that money to double?

24. Suppose you borrow $20,000 to buy a new car, the bank charges an annual interest rate of 3%, and you have 5 years to pay off the loan. Determine an underestimate and overestimate for your monthly payment, then determine the exact monthly payment.

25. Repeat the previous problem, but this time, the bank charges 6% annual interest and gives you 10 years to pay off the loan.

26. Use the divide-and-average method to estimate the square root of 27.

27. Use the divide-and-average method to estimate the square root of 153.

28. Speaking of 153, that's the first 3-digit number equal to the sum of the cubes of its digits ($153 = 1^3 + 5^3 + 3^3$). The next number with that property is 370. Can you find the third number with that property?

Solutions for this lecture begin on page 108.