



Grand Rapids
Community College

Business Math -
BA 150

Credit by Examination

Student Study Manual

F. Recommended Reference Books

1. Business Mathematics for Colleges, Sixth Edition
Publishers: South-Western
Authors: Louis Rice, Blair Maine, James Deitz

2. Collegiate Business Mathematics
Publisher: Richard D. Irwin
Authors: Hyman Berston, Paul Fisher

3. Business Mathematics
Publisher: Random House
Authors: Richard Thorn, Stephen Kwitowski

4. Applied Business Mathematics, 2nd Edition
Publisher: Hoibrook Press
Authors: Marcus Morao, William Aubuchon III

5. Essentials of Business Mathematics
Publisher: Rinehart Press
Authors: Alton Parish, William Kindsfather

COURSE TITLE: Business 104, Business Mathematics (4 Credit Hours)

A. Course Description

Includes the study of percentage, discounts, markup, commission, interest, annuities, insurance, stocks, and bonds.

The following mathematical concepts are included:

fractions
decimals
percentage
cash and trade discounts
commission
markup
simple interest
discounting commercial paper
charges for credit
bank records
sales, custom, and property tax
inventories and turnover
depreciation
insurance
bonds
compound interest
present value
annuities
interest variables

B. Student Performance Objectives

To provide students with:

1. An understanding and application of mathematical concepts to business activities.
2. Increased competency in fundamental mathematical and arithmetic skills.
3. An explanation of business procedures and terminology to aid in understanding and reasoning.
4. The ability to reach practical solutions to mathematical problems that arise daily in various areas of a business career.
5. The ability to solve basic problems to aid in decision making.

1. The exam has a two-hour limitation.

2. All necessary supplies will be furnished by the college.

D. Test Norm Levels

To receive credit a student must achieve a 70% score on the examination.

1. Add: $3 \frac{1}{14} + \frac{1}{9} = 2 \frac{1}{21}$
2. Multiply: $\frac{1}{25} \times 4 \frac{3}{8} \times \frac{2}{7}$
3. Divide: $1 \frac{1}{8} \div \frac{3}{5}$
4. Henry Holmes received a dividend of \$125, which is 5% of his investment. What is the size of his investment?
5. If 12% of a number is 27, what is the number?
6. \$15 is what percent of \$90?
7. What is 1/8% of \$2,000?
8. The price of mixed candies increased from 75c a pound to 90c a pound. What percent did the price increase?

9. In a small department store, the square feet of floor space occupied by each department is as follows:

Department A	9,000 square feet
Department B	7,000 square feet
Office	1,000 square feet
Storage	3,000 square feet

The monthly rent for the store is \$720. Determine how much of the monthly rent should be distributed to each department on the basis of floor space occupied.

What is the former price of a dress that was marked up to sell for \$27.50?

11. Following a 25% reduction in price, a coat sold for \$30. What was the regular price of the coat?

12. Balance shown by the bank statement of the Dearborn Chemical Company, June 30, 1970, \$3,520.55. Balance as shown by the checkbook, \$2,908.12. Checks outstanding: #36, \$38.50; #87, \$28.43; #95, \$6.25; #96, \$115.00; #97, \$30.75. Returned check charge to the depositor's account by the bank, \$31.00. Collection charges, \$3.50. Collection made by the bank for the depositor, \$150. Reconcile the balances.

13. Express one-hundred-forty-two and one-hundred-sixty-seven-thousandths as a decimal number.

14. A real estate agent charges 3% of the purchase price of a home as his fee. If his commission on a sale is \$340, for what did the home sell?

15. A salesman is paid a monthly salary of \$300 plus a 4% commission on all net sales in excess of \$5,000. Find his wages when his net sales for the month were \$13,500.

16. Jones and Cohen, commission merchants, have sold some produce for a farmer for the gross amount of \$1,346. Jones and Cohen paid \$210 in transportation charges and \$31 in storage costs. Their commission is 7%. Determine the net proceeds received by the farmer on this sale.

17. On March 3, Draxel received a \$744.80 partial payment from Jones Furniture company. Draxel had sent an invoice for \$1,500 on February 22 with terms 2/20, n/30. If Draxel grants a discount on a partial payment, how much will they credit Jones' account for?

18. An invoice bearing terms 2/10, n/30, was dated September 15. It listed \$450 for merchandise and \$5 for shipping costs. Upon examination of the goods, \$45 worth of damaged merchandise was found and returned to the seller. How much should be paid if the bill is paid by September 20?

19. What is the markup percent on retail of a card table costing \$30 and selling for \$50?

20. The retail price of a phonograph is \$60 and it is marked up 33 $\frac{1}{3}$ % on retail. What is the cost?

21. What is the markup percent on cost for a transistor radio which costs \$15 and retails for \$25?

22. A sport coat that retails for \$50 has a markup of 60% on cost. Find the cost.

23. When visiting the furniture market a buyer purchases a table for \$80 and plans to mark it up 40% of cost. What should the retail price be?

24. Phillips Distributing Company has been selling wheelbarrows for \$26, less 10%. What additional discount percent must they offer to reduce their net price to \$15.30?

25. A wholesaler purchased an item for \$18 and he marked it up to allow a 20% return on cost. At what price must he list the article to allow a 10% trade discount and retain his 20% markup?

26. On Nov. 1, Jones borrowed \$2,000 from the First National Bank for a period of 3 months, with interest at 6%. On January 1, he repaid \$1,000. The bank deducted the interest from the payment and applied the difference to the principal. Interest is computed on 30-day month time. What amount is due at maturity?

27. Tom Smith bought a home for \$25,000. He made a down payment of \$6,000 and obtained a mortgage for the balance at 6% for 25 years. The monthly payment required to pay principal and interest on a loan of \$1,000 for this period of time and at this rate is \$6.45.

1) What was the amount of the monthly payment?

2) How much of the first payment applies to the principal?

28. Find the amount of interest using a percent and day method (6% - 60 day, 4% - 90 day, etc.)

1) \$600 - 66 days - 7%

2) \$9,000 - 135 days - 4%

3) \$500 - 90 days - 8%

29. Find the principal of a loan that costs \$90 in interest at 6% for 180 days.
30. In how many days will \$120 produce \$2.40 in interest at 8%?
31. A loan of \$8,000 produces interest of \$160 every 80 days. Calculate the rate of interest charged.
32. A note for \$600, due in 30 days and bearing interest at $4\frac{1}{2}\%$, dated June 20 was discounted on July 25. If the discount rate was 6%, what were the proceeds?
33. Mr. Hays gave River Manufacturing a 90-day note for \$1,200 on Oct. 10. If it was discounted at the bank on Dec. 9 at 6%, what were the proceeds?
34. Mrs. Roppen purchased a carpet priced at \$450 cash from the J.C. Furniture Company. Terms were \$50 down and the balance in 10 monthly payments of \$43.30 each. If Mrs. Roppen bought the carpet on time, what was the total cost? What was the annual rate of interest on the unpaid balance?
35. Mr. Eupp borrowed \$200 from the Local Finance Company at an annual rate of 14% on the unpaid balance. If he repaid the loan in 5 monthly payments, what was the amount of each payment?

36. Determine the amount of depreciation and book value for the first two years using the straight line method on a machine that cost \$25,000, has an estimated life of 10 years and scrap value of \$1,000.
37. Using the sum of the year digits method determine the depreciation and book value for the first two years on a machine costing \$7,000; scrap value, \$700; estimated life, 7 years.
38. Determine the depreciation and book value for the first two years on a machine costing \$20,000 with a scrap value of \$600 and an estimated life of ten years. Use the declining balance method.
39. Godfreys Manufacturing Company purchased a machine for \$8,000. The freight was \$64, and the cost of installation was \$210. It was estimated that the machine would operate profitably for 35,000 hours, after which its resale value would be \$840. What is the hourly depreciation for this machine?
40. The Brown Manufacturing Company made purchases as shown below. The inventory at the end of the year was 325 units. Compute the inventory value by each of the following methods (1) average cost (2) FIFO (3) LIFO

<u>Date</u>	<u>Units</u>	<u>Unit Cost</u>
Jan. 4	200	\$1.00
March 17	100	1.25
June 5	400	1.50
Nov. 20	300	1.75

41. Dorman bought a home for \$24,000. It was assessed at 50% of that price. The town had a total assessed valuation of \$600,000,000 and its budget raised by taxation was \$19,200,000. In addition to this amount, there was a school tax rate of 9 mills.

a. What is the total number of mills that Mr. Dorman pays?

b. How much tax did Dorman pay on his property?

42. In the abbreviated payroll sheet below, the workers are paid time and one half for any time worked in excess of 40 hours. Complete the payroll.

Name	Total Hours	Regular Hours	Regular Pay	Overtime Pay	Total Wages
Bode, Ray	46	40	\$3.70		
Gennaro, Lou	35	35	3.20		
Romani, Dave	47	40	3.60		

43. In Michigan a store selling 640 items in separate sales for 11c each would

a. collect how much tax?

b. pay how much tax to the state?

44. Godfrey's Barbershop had a beginning inventory of \$40,000 at cost. The total purchases for the year at cost were \$280,000. Sales totaled \$350,000. Find the ending inventory at cost, if:
- the markup was 30% of retail
 - the markup was 25% on cost
45. From the following information, find the merchandise inventory turnover at cost: purchases, \$340,000; sales, \$400,000; and merchandise inventory at the end of the period, \$100,000; merchandise inventory at beginning of period \$60,000.
46. \$5,000, including a 6% interest charge is paid annually on a 10 year loan. What was the amount of the original loan?
47. Mr. Thomas owes Mr. Marshall \$6,000 which is due at the end of two years. If money is worth 4% compounded quarterly, how much should Mr. Marshall accept now in full settlement of the debt?
48. A man deposited \$900 in a mutual savings bank. If the institution paid 4% compounded semiannually, how much money had accumulated at the end of 7 years?
49. If \$5,000 is contributed to a fund at the end of each six month period during a five year period and earns 4% interest compounded semiannually, how much will the fund amount to at the end of five years?

50. Mr. Johnson made payments of \$500 at the beginning of each year for 8 years earning interest at 4% compounded annually. How much money did he accumulate?
51. Mr. Wilson wishes to establish an income of \$3,000 every six months for 4 years to finance his son's college education. If he could invest the necessary amount at 6% compounded semiannually, how much would it cost?
52. A corporation must retire a \$100,000 bond issue in 10 years when the bonds mature. What sum should be set aside each year at 5% interest compounded annually to meet this debt?
53. Mr. Wright agrees to amortize a \$7,000 loan, the loan bearing interest at 5% compounded annually. In order to pay the loan at the end of 8 years, how much must be set aside each year if his money earns 4% compounded annually?
54. How many years must \$2,000 be invested at 4% compounded annually to be worth \$3,202?
55. Find the present value of \$1,194.00 if money is worth 6% compounded semiannually and is due in 9 years.
56. A house valued at \$30,000 was insured for \$20,000 under an 80% insurance policy. How much would be paid for fire damage at \$18,000?

57. What is the premium rate per \$100 if \$75 was paid as the annual premium on a fire insurance policy for \$5,000?

ANSWERS

1. 5 29/125
2. 1/20
3. 1 7/8
4. \$2,500
5. 225
6. 16 2/3%
7. \$2.50
8. 20%
9. (1) \$324
(2) \$252
(3) \$ 36
(4) \$108
10. \$25
11. \$40
12. Bank Statement - \$3,251.62
Checkbook - \$3,251.62
13. 142.0160
14. \$18,000
15. \$640
16. \$1,010.78
17. \$760
18. \$401.90
19. 40%
20. \$40
21. 66 2/3%
22. \$31.25
23. \$112
24. 15%
25. \$24
26. \$1,025.10
27. (1) \$129
(2) \$29.00
28. (1) \$7.70
(2) \$135
(3) \$10
29. \$3,000
30. 90 days
31. 9%
32. \$799.92
33. \$1,194
34. 13%
35. \$42.40

36. Depreciation
(1) \$2,400
(2) \$2,400
Book Value
(1) \$22,600
(2) \$20,200
37. Depreciation
(1) \$1,575
(2) \$1,350
Book Value
(1) \$3,425
(2) \$4,075
38. Depreciation
(1) \$4,000
(2) \$3,200
Book Value
(1) \$16,000
(2) \$12,800
39. 21.2c
40. (1) \$471.25
(2) \$562.50
(3) \$362.50
41. (a) 41 mills
(b) \$492
42.

Reg. Pay	O.T.	Tot.
\$148	33.50	181.50
112	0	112.00
152	39.90	191.90
43. (a) None
(b) \$2.32
44. (a) \$75,000.
(b) \$40,000
45. 3.75
- *46. \$36,800
47. \$5,540.40
48. \$1,187.46
49. \$54,746.50
50. \$4,791.35
51. \$21,058.80
52. \$7,950.52
53. \$1,122.38
54. 12 years
55. \$701.24
56. \$15,000
57. \$2.50

Answers for problems 46 through 55 may vary slightly. These answers were derived by the use of tables and some tables are more comprehensive than others.