

# Supervisory Management

## Application Problems

General Math



### Applied Problems—Fractions

1. Newspaper ads are sold by the column inch (c.i.) What is the total number of column inches for a month of ads run by Nifty Printer if their ads were  $2\frac{1}{2}$ ,  $5\frac{3}{4}$ , and  $6\frac{3}{4}$  c.i.? (Express answer in fractional form.)
2. Inmo Softgoods has  $2\frac{3}{4}$  rolls of a certain kind of upholstery fabric in stock. Three orders have been received that require  $\frac{5}{8}$ ,  $1\frac{1}{2}$  and  $\frac{3}{4}$  roll, respectfully. Is there enough fabric in stock?
3. What is the volume of a rectangular, cardboard box with interior dimensions  $10\frac{1}{2}$  in. long,  $7\frac{1}{4}$  in. wide, and  $4\frac{3}{4}$  in. deep? (Hint: Volume = length x width x height.) (Express answer in fractional form.)
4. In a print shop, one unit of labor is equal to  $\frac{1}{6}$  hour. How many hours are involved in 72 units of work?
5. How many full  $3\frac{3}{4}$ -in. sheets can be cut from  $27\frac{1}{4}$ -in. stock?
6. A hardcover book weighs  $1\frac{1}{8}$  lb. Find the total book weight of 12 cartons each containing 20 books.

### Applied Problems—Decimals

- Determine the actual cost for the company car purchase:

Invoice	\$17,905.00
Destination/Delivery	\$565.45
CD player/changer	\$135.95
Sunroof	\$695.75
Tax and License	\$1,070.87
Rebate	(\$650.00)
- A rug cleaning machine sells for \$789. It can be bought “on time” for 36 monthly payments of \$27.15. How much extra do you pay by purchasing it on the installment plan?
- You worked the following hours this past work week: 9.5 hrs., 11.25 hrs., 10 hrs., 7.75 hrs and 6.25 hrs. Find the average number of hours worked per day. (Round answer to one decimal place.)
- Packers earn \$9.76 per hour and receive time and a half for hours over 40 per week. Larry Merry worked 46.25 hours this week, determine his earnings. (Round answer to nearest penny.)
- A plant manager must determine the cost of roofing a small storage building for maintenance. The building requires 139.9 sq. ft. of material at \$12.79/sq. ft. It also requires 8 hours of labor at \$17.75/hour and 2.25 hours of labor at \$26.63/hour. Find the total cost of the roofing project. (Round answer to nearest penny.)
- Fourteen employees each work 40 hours this week and are paid the federal minimum wage of \$5.15/hour for covered, nonexempt employees. Determine the gross amount need for this week’s payroll.

### Applied Problems—Percents

1. If the rate of social security tax is 6.2%, find the tax on gross earnings of \$523.80. (Round to nearest penny.)
2. Brandy Rogers has a gross earnings of \$1,099.45 for two weeks. If Medicare tax is 1.45% of the earnings, how much is deducted for Medicare tax? (Round to nearest penny.)
3. An employee's gross earnings for a pay period are \$798.51 with the net pay of \$572.34. What percent of the gross pay are total deductions? (Round answer to nearest tenth.) [Note: Deductions = Gross pay – Net pay]
4. Curtis Matt has a monthly gross earnings of \$2,134.56. If 6.2% is paid for social security taxes and 1.45% for Medicare taxes, what is his net monthly earnings? (Round answer to nearest penny.) [Note: Net Pay = Gross pay – Deductions]
5. What will you pay on a \$189.97 item advertised at 25% off? (Round answer to nearest penny.)
6. A supplier gives a 5% discount as a promotion on a new product. If the total for the new product purchased was \$1,075, how much was the discount? (Round answer to nearest penny.)

7. At Inmo Softgoods, 2.75 yards of fabric are wasted during the cutting process from a 27.5 yard roll. Find the percent waste. (Round answer to nearest tenth.)
  
8. A restaurant manager needs 750 lbs of red potatoes. Because of spoilage and/or damage, she expects to use only 95% of the potatoes. What is the minimum amount she should order to guarantee the needed 750 lbs? (Round answer to nearest whole number.)
  
9. A dairy products representative generated \$475,000 in sales last year and was paid \$41,575 in salary. If the representative's salary is figured on a commission of sales, find the percent commission rounded to one decimal place.
  
10. The morning production report indicates that thirteen gizmos were rejected from a run of 3,000. What percent of the gizmos passed inspection? (Round answer to one decimal place.)
  
11. The Acme Gizmos Co. weekly report showed 30,000 gizmos were produced. If the weekly production decreases by 6%, what is the new production?
  
12. China Construction Bank, one of the country's big four State-owned commercial banks, announced that its profit increased by \$1.6 billion or 33.9% compared with the previous year. What profit did it earn the previous year? (Source: [www.chinadaily.com](http://www.chinadaily.com)) (Round answer to nearest hundred.)

13. Matthew Cinder currently earns \$21,955 annually and has received a 3% raise during his evaluation. What will his new annual earnings be with the raise? (Round answer to nearest dollar.)
14. A ventilation project actually cost \$6,570 and was 115% of the budgeted amount. Find the budgeted amount. (Round answer to nearest dollar.)
15. A manager told his employees that the planning and designing of the new project would take 25% of the total project time. If it took 38 days to complete planning and designing, how long was the total project?
16. At Risky Realtors, Jan, the real estate salesperson, receives 75% of the 3% commission on a house that sold for \$125,750. How much does she earn on the sales? (Round to nearest penny.)
17. Laurence receives \$375 per week plus a 5% commission for all sales at Fueler's. Last week, Laurence sold \$1,750.55, how much is his weekly pay? (Round to nearest penny.)
18. Wage garnishment is a legal procedure in which a person's earnings are required by court order to be withheld by an employer for the payment of a debt such as child support. An employee's gross earnings in a particular workweek are \$240.00. After deductions required by law, the disposable earnings are \$210.00. In this week, 25 percent of the disposable earnings may be garnished.
- Find the garnished amount of disposable earnings.
  - Determine the employee's net pay after the garnished amount is deducted.

19. An employee paid every other week has disposable earnings of \$400.00 for the first week and \$40.00 for the second week of the pay period, for a total of \$440.00. In a biweekly pay period, when disposable earnings are above \$412.00 for the pay period 25% may be garnished. It does not matter that the disposable earnings in the second week are less than \$154.50. Find the amount garnished from this employee's disposable earnings.
20. The number of Age Discrimination in Employment Act (ADEA) charges resolved during fiscal year 2000 was 14,672. In fiscal year 2001, there were 15,155 ADEA charges resolved. Find the percent increase in resolved charges. (Round answer to nearest tenth of a percent.)
21. The monetary benefits in Age Discrimination in Employment Act (ADEA) charges were \$42.2 million in fiscal year 2000. There was \$8.5 million dollars more in monetary benefits the next fiscal year. Find the percent increase. (Round answer to nearest tenth of a percent.)
22. In 1999, the cost of workers' compensation per \$100 of covered payroll in Minnesota was \$1.37. This is a \$0.07 decrease in the cost from 1998.
- Find the cost per \$100 of covered payroll for 1998.
  - Find the percent decrease from 1998 to 1999 for the cost of workers' compensation. (Round to nearest tenth.)

### Applied Problems—Measurement

1. The reception area needs new carpeting. It has been calculated that 4,830 sq. ft. of carpeting are needed. Since carpet is sold in square yards, find the amount need in square yards. (Round to nearest tenth.)
2. The office manager has received two bids for carpet for the reception area. One flooring supplier bid \$34.05 per square yard while the second supplier bid \$4.95 per square foot.
  - a. Which is the better buy?
  - b. How much will be saved on 84.5 sq. yds?
3. Roofing tar costs \$12.95 per gallon. Your Canadian associate wants to know how much the roofing tar costs per liter (in American currency.) Find the cost per liter. (Round to nearest penny.)
4. Your Canadian associate says his company car gets 14.5 km per liter of gas. What is the fuel economy for this car in miles per gallon? (Round to nearest tenth.)
5. Your company produces 18-inch monitors, convert this measurement to cm for Canadian customer's information. (Round to nearest hundredth.)

6. After a business meeting, you are discussing the recent Indy 500 race. European associates want to know how many kilometers equal the 500-mile race. Find the number of kilometers driven during the Indy 500 race.
  
7. Your confectionary product is packaged in 7.5 oz bags, find the equivalent weight in grams. (Round to nearest whole gram.)
  
8. As a special promotion, you are putting your carbonated beverage in a 21 fl oz bottle, find the equivalent volume in ml. (Round to nearest whole ml.)
  
9. Nothing holds off Hong Kong's winter chill like a hearty bowl of snake soup. Vincent Li, a 26-year-old financial agent, puts on snake dinners for employees every year. An average snake meal costs 25.7109 Hong Kong dollars (HKD.) If 1 HKD = \$0.128350 US dollars, find the cost for a snake dinner. (Round to nearest penny.)

### Applied Problems—Formulas

1. Find the interest on a loan of \$9,100 if the annual interest rate is 5.6% and the loan is for 9 months. (Recall,  $I = PRT$  where I-interest, P-principal, R-rate in decimal form and T-time in years.) (Round answer to nearest penny.)
2. The principal amount of a loan is \$1,200 and the interest rate is 7.1%. If the loan is paid in 3 months, find the interest. Note:  $I = PRT$ . (Round answer to nearest penny.)
3. What is the interest on a short-term loan for \$1,230 at 13.1% interest paid in 6 months? Note:  $I = PRT$ . (Round answer to nearest penny.)
4. What is the interest rate on an account with a principal of \$6,100, interest equaling \$549 for four years? ( $R = I/(PT)$ , where I-interest, P-principal, T-time and R-rate. Note: R-rate is given as a decimal and will need to be converted to an equivalent percentage.) (Express answer with two decimal places.)
5. A certificate of deposit with a principal of \$34,567 earns \$1,175.28 interest during two years. Find the interest rate. Note:  $R = I/(PT)$  (Express answer with two decimal places.)
6. One way in which an owner of a shop can evaluate the success of its business is to keep track of “production per square foot.” To calculate this indicator, total revenue is divided by the area (in square feet) of the shop. If a 2,145-sq. ft. shop generated total revenue of \$456,789, determine the production per square foot. (Round answer to nearest dollar.)

7. Macrohard stock sells for \$28.07 per share. The company has a \$0.75 per share earning. Find the company's price to earning ratio by dividing the price per share by its earning per share. (Round answer to two decimal places.)
  
8. If you earn \$624.19 for a 32-hour work week, how much would you earn for a 40-hour work week at the same hourly rate? (Round answer to nearest penny.)
  
9. A machine can produce 6 parts in 20 minutes. How many parts can the machine produce in 3 hours?
  
10. A cleaning service can complete a job using fourteen workers in 6 hours. If the same size job must be finished in 2 hours, how many workers should be used to get the job done?
  
11. If 21 line workers can complete an order in 5 hours, how long will the same order take if there are only 18 line workers? (Round to nearest tenth.)
  
12. Ten presses can complete a certain order in 6 hours, if two presses are taken off line, how long will it take the remaining presses to complete the same order?
  
13. If you received \$658.13 for 13  $\frac{1}{2}$  hours, what should you expect to receive for 40 hours of work at this same pay rate? (Round to nearest penny.)

14. At your company, paid vacation is available to regular full-time and regular part-time employees following their first-year anniversary and is provided based on the following calculations: During the first 2 (two) years of employment, vacation time will be earned at the rate of 0.0192 hours per hour worked. During the 3<sup>rd</sup> (third) through 5<sup>th</sup> (fifth) years of employment, paid vacation time will be earned at the rate of 0.0384 hours per hour worked. During the 6<sup>th</sup> (sixth) and following years of employment, vacation time will be earned at the rate of 0.0586 hours per hour worked.

Example: Employee “A” works 25 hours per week for 52 continuous weeks her first year with the company. How much vacation time is earned? (Round to nearest hour.)

$$\frac{25 \text{ hr}}{\text{wks}} \times 52 \text{ wks} = 1,300 \text{ hours}$$

Earned vacation: 1,300 hours worked x 0.0192 = 24.96 h or 25 hours.

- a. Find earned vacation for Employee B who works 60 hours every two weeks this past year and is in her second year of employment.
  - b. Find earned vacation for Employee C who works 40 hours every week, working 48 weeks and has been with the company 15 years.
  - c. Find earned vacation for Employee D who works 35 hours every week, for 52 weeks and has been with the company four years.
15. An employee on a \$320.00 weekly draw against commissions has disposable earnings each week of \$285.00. Commissions, paid monthly, total \$2,000.00 for July after deductions required by law. Each draw and the balance due at the monthly settlement are separately subject to the law's restrictions. Thus, 25% of each draw may be garnished. (Garnish amount = disposable income x rate)

$$\text{Weekly garnished amount: } \$285.00 \times 0.25 = \$71.25$$

$$\text{Pay for one month: } \$285.00 \times 4 = \$1,140.00$$

At the end of the month, the \$1,140.00 previously drawn is subtracted from the \$2,000.00 commission figure, and 25% of the balance may be garnished. Find the final garnishment from the balance of this employee's monthly pay.

16. A tipped employee engages in an occupation in which he or she customarily and regularly receives more than \$30 per month in tips. An employer of a tipped employee is only required to pay \$2.13 per hour in direct wages if that amount combined with the tips received at least equals the federal minimum wage (\$5.15/hour.) If the employee's tips combined with the employer's direct wages of at least \$2.13 per hour do not equal the federal minimum hourly wage, the employer must make up the difference.

You are the manager of Mama's Café; below are the monthly hours and tips reported by the wait staff. Calculate total earnings for each employee. Determine whether each has received at least the minimum hourly wage. If an employee has not received the minimum hourly wage, find the amount of money needed to be paid by the employer.

$$\text{Total Earnings} = \text{Hrs. worked} \times \$2.13 + \text{Tips}$$

$$\text{Ave. Hourly Wage} = \text{Total earnings} / \text{hrs. worked}$$

$$\text{Employer Pay Obligation} = \text{Hrs. worked} \times \$5.15 - \text{Tips}$$

Monthly	Hours	Tips	Total Earnings	Ave. Hourly Wage	Employer Pay Obligation
<b>Sam</b>	22	\$112.75			
<b>Bea</b>	134	\$451.11			
<b>Jo</b>	121.5	\$307.25			
<b>Jack</b>	97.75	\$281.10			

17. The food cost percentage can be calculated using the following formula:

$$\text{Food Cost Percentage} = (\text{Cost of Purchased Food} / \text{Total Revenue}) \times 100$$

The percentage shows the food cost in relation to total revenue for a certain time period. Tracking the food cost to a revenue ratio on a weekly or monthly basis can identify trends and pinpoint potential problems. A school food service program has a total revenue of \$30,000 for the prior month and a food cost of \$15,500 for the same month. Using the formula above, find the food cost percentage. (Round to nearest whole number.)

18. Use the following 2000 injury claims from Wisconsin Department of Workforce Development to find the average indemnity cost per claim for each county listed. (Average indemnity cost per Claim = Lost Wage Compensation / Claims) (Round to nearest dollar.)

<b>County of Injury</b>	<b>Claims</b>	<b>Lost Wage Comp.</b>	<b>Ave. Cost/Claim</b>
Crawford	121	\$407,391	
Dane	4,008	\$13,636,159	
Grant	282	\$1,046,718	
Iowa	111	\$314,665	
LaFayette	52	\$172,625	
Milwaukee	10,113	\$47,306,383	
Richland	132	\$351,411	
Sauk	560	\$1,839,081	
Vernon	124	\$270,953	

### Applied Problems—Data

1. Using Excel, make a bar graph to represent the following information:

<b>Age Discrimination in Employment Act Charges</b>		
Fiscal Year	Receipts	Resolutions
1992	19,573	19,975
1993	19,809	19,761
1994	19,618	13,942
1995	17,416	17,033
1996	15,719	17,699
1997	15,785	18,279
1998	15,191	15,995
1999	14,141	15,448
2000	16,008	14,672
2001	17,405	15,155
2002	19,921	18,673
2003	19,124	17,352

Source: <http://www.eeoc.gov/stats/adea.html>

2. Using Excel, make a line graph from the following data:

<b>Age Discrimination in Employment Act Charges</b>	
Fiscal Year	Monetary Benefits (Millions)*
1992	\$57.3
1993	\$40.7
1994	\$42.3
1995	\$29.4
1996	\$31.5
1997	\$44.3
1998	\$34.7
1999	\$38.6
2000	\$45.2
2001	\$53.7
2002	\$155.7
2003	\$48.9

\*Does not include monetary benefits obtained through litigation.

Source: <http://www.eeoc.gov/stats/adea.html>

### Applied Problems—Statistics

1. Quilting Bees spent the following amounts on advertising during the last six months.

July	\$780.61	August	\$450.21	September	\$763.99
October	\$800.12	November	\$979.59	December	\$983.12

- a. Find the mean monthly advertising expense. (Round answer to nearest penny.)
- b. Find the median monthly advertising expense. (Round answer to nearest penny.)
2. Listed below are 2002 average salaries by region for design and development engineers and managers.

San Jose, CA	\$111,800
Dallas, TX	\$103,500
Austin, TX	\$97,100
Boston, MA	\$92,100
Portland, OR	\$91,800

Source: EE Times, 08/29/03

- a. Find the mean salary. (Round to nearest hundred.)
- b. Find the standard deviation. (Round to nearest hundred.)
- c. 95% of the salaries run between \_\_\_\_\_ & \_\_\_\_\_

3. Listed below is the 2002 Wisconsin workers compensation that are due to miscellaneous causes.

<b>Type</b>	<b>Cost Per Claim</b>
Absorption, ingestion, inhalation	\$29,610
Animal or insect	\$1,650
Cumulative (all other)	\$7,153
Electrical current	\$9,179
Explosion or flare back	\$7,553
Foreign body in eye	\$1,041
Other	\$7,255
Other than physical cause of injury	\$5,420

- a. Find the mean. (Round to nearest dollar.)
- b. Find the median.

4. Listed below are the 2002 Wisconsin workers compensation due to “striking against or stepping on” causes.

<b>Type</b>	<b>Cost Per Claim</b>
Moving parts of machine	\$5,908
Sanding, scraping, cleaning operations	\$2,027
Stationary object	\$3,406
Stepping on sharp object	\$2,294
Striking against or stepping on	\$5,280

- a. Find the standard deviation for this data. (Round to nearest dollar.)
- b. 68% of the cost per claim run between \_\_\_\_\_ & \_\_\_\_\_

### Applied Problems—Finance

1. Jane Way borrowed \$65,000 for 5 years at 6.75% to start up Bowling Way.
  - a. Find the total interest owed if loan is calculated using simple interest.  
(Note:  $I = PRT$ )
  - b. What is the total amount Jane will pay the bank?
  - c. What will be Jane's equal monthly payments? (Round to nearest penny.)
  
2. Complete the purchase order for Harlem's Furniture & Appliance.

Harlem's Furniture & Appliance Somewhere, WI			
Customer: Your Own Business, Fennimore, WI			
Qty	Item	Unit Price	Amount
7	desks	\$541.00	
14	4-dr. files	\$148.50	
7	chairs	\$219.00	
5	mats	\$91.50	
		<b>Subtotal</b>	
		<b>12% Discount</b>	
		<b>Tax (5.5%)</b>	
		<b>Shipping</b>	
		<b>Total</b>	

Shipping	
\$0-\$500	\$47.50
\$501-\$2,500	\$125.00
\$2,501-\$5,000	\$195.00
\$5,001+	\$275.00

3. Harlem's Furniture & Appliance has the following terms: 2/10, net 30. Find the amount due on this purchase in #2, if the bill is paid within 10 days. (Round to nearest penny.)

4. The Dress4Success clothing store purchased suits each for \$525 and marked them up 65%. Find the selling price. (Round to nearest penny.)
  
5. The Dress4Success clothing store's selling price for a pinstripe suit is \$776. The markup is \$291.
  - a. Find the cost of the suit.
  
  - b. Find the markup rate. (Round to nearest tenth.)
  
6. The selling price of a Italian leather shoes is \$129. The Dress4Success's cost was \$79.
  - a. Find the markup.
  
  - b. Find the markup rate. (Round to nearest tenth.)

### Applied Problems – Algebra

1. A computer repair technician charges \$60 for a service call plus \$43 per hour of work. The formula  $C = 60 + 43H$  represents the total charge,  $C$ , for  $H$  hours of work. If a bill totals \$382.50, find how many hours of labor were charged.
  
2. Bill, Mara, and Ginger are partners in a consulting business. Because of the differences in their contributions, it was decided that Ginger's share of the profits will be twice as much as Bill's share, and Mara's share will be three times as much as Ginger's share. How should a profit of \$167,100 be divided among the three partners? (Round answer to nearest penny.)

## Answer Key—Applied Problems

### Fractions

1.  $17 \frac{1}{2}$  c.i.
2. No
3.  $361 \frac{19}{32}$  cu. in.
4. 12 hours
5. 7 sheets
6. 270#

### Decimals

1. \$19,723.02
2. \$188.40
3. 9.0 hours
4. \$481.90
5. \$1,991.24
6. \$2,884.00

### Percents

1. \$32.48
2. \$15.94
3. 28.3%
4. \$163.29
5. \$142.48
6. \$53.75
7. 10.0%
8. 789#
9. 8.8%
10. 99.6%
11. 28,200
12. \$4,719,800
13. \$22,614
14. \$5,713
15. 152 days
16. \$2,829.38
17. \$462.53
18. a. \$52.50  
b. \$157.50
19. \$110
20. 3.3%
21. 20.1%
22. a. \$1.44  
b. 4.9%

### Measurement

1. 536.7 sq. yds.
2. a. 1<sup>st</sup> supplier  
b. \$887.25
3. \$3.42/L
4. 34.1 mpg
5. 45.72 cm
6. 805 km
7. 212 g
8. 622 ml
9. \$3.30

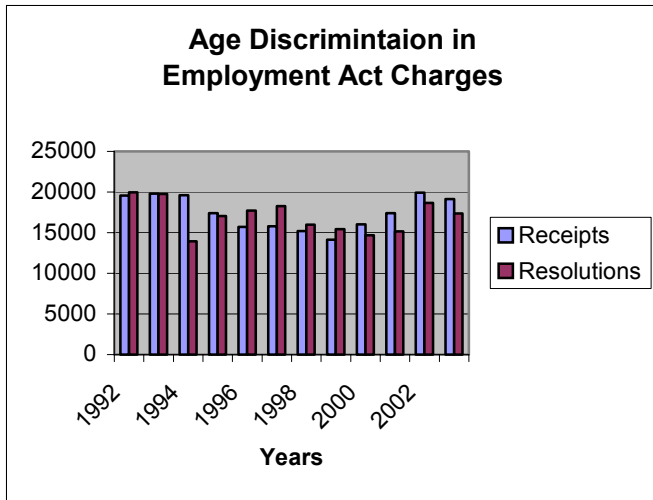
### Formulas

1. \$382.20
2. \$21.30
3. \$80.57
4. 2.25%
5. 1.70%
6. \$213/sq. ft.
7. 37.43
8. \$780.24
9. 54 parts
10. 42 workers
11. 5.8 hours
12. 7.5 hours
13. \$1,950.01
14. a. 30 hours  
b. 113 hours  
c. 70 hours
15. \$215
16. Sam: \$159.61, \$7.26, --  
Bea: \$736.53, \$5.50, --  
Jo: \$566.05, \$4.66, \$318.48  
Jack: \$489.31, \$5.01, \$222.31
17. 52%
- 18.

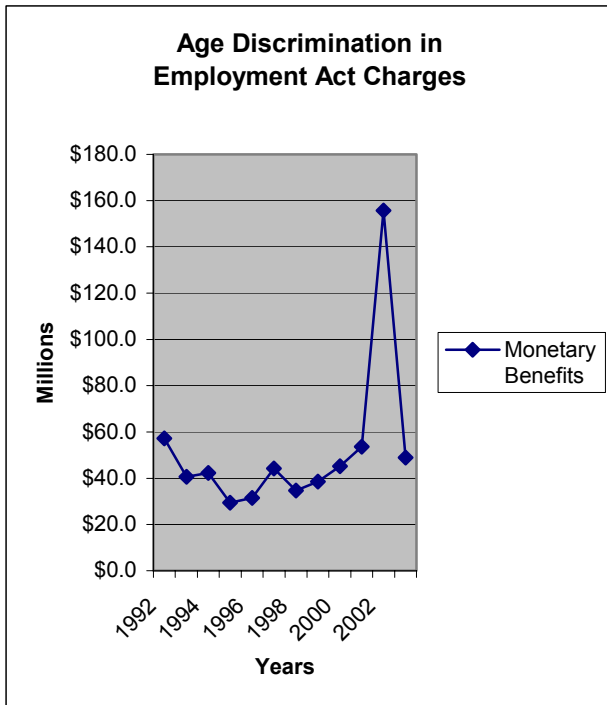
\$3,367
\$3,403
\$3,712
\$2,835
\$3,320
\$4,678
\$2,662
\$3,284
\$2,185

Data

1.



2.



Statistics

- a. \$729.94  
b. \$790.37
- a. \$99,300  
b. \$8,500  
c. \$82,300, \$116,300
- a. \$8,608  
b. \$7,204
- a. \$1,746  
b. \$2,037, \$5,529

Finance

- a. \$21,937.50  
b. \$86,937.50  
c. \$1,448.96
- \$3,787; \$2,079; \$1,533; \$457.50;  
\$7,856.50; (\$942.78); \$380.25;  
\$275.00; \$7,568.97
- \$7,423.10
- \$866.25
- a. \$458  
b. 60%
- a. \$50  
b. 63.3%

Algebra

- 7.5 hours
- Bill: \$18,566.67  
Ginger: \$37,133.34  
Mara: \$111,400.02

## Marketing Applications Quiz

### Fractions

1. Newspaper ads are sold by the column inch (c.i.) What is the total number of column inches for a month of ads run by Nifty Printer if their ads were  $3\frac{1}{2}$ ,  $7\frac{3}{4}$ ,  $3\frac{1}{4}$ , and  $4\frac{3}{4}$  c.i.? (Express answer in fractional form.)
2. Inmo Softgoods has  $2\frac{3}{4}$  rolls of a certain kind of upholstery fabric in stock. Three orders have been received that require  $\frac{3}{8}$ ,  $1\frac{1}{4}$  and  $\frac{7}{8}$  roll, respectfully. Is there enough fabric in stock?
3. What is the volume of a rectangular, cardboard box with interior dimensions  $13\frac{1}{2}$  in. long,  $6\frac{1}{4}$  in. wide, and  $2\frac{3}{4}$  in. deep? (Hint: Volume = length x width x height.) (Express answer in fractional form.)
4. In a print shop, one unit of labor is equal to  $\frac{1}{6}$  hour. How many hours are involved in 80 units of work?
5. How many full  $3\frac{1}{4}$ -in. sheets can be cut from 27-in. stock?
6. A hardcover book weighs  $1\frac{3}{8}$  lb. Find the total book weight of 12 cartons each containing 20 books.

## Decimals

1. Determine the actual cost for the company car purchase:

Invoice	\$22,985.00
Destination/Delivery	\$659.95
Alarm System	\$275.65
Alloy Wheels	\$635.87
Tax and License	\$1,310.63
Rebate	(\$1,000.00)

2. A copier sells for \$7,895. It can be bought “on time” for three years with monthly payments of \$245.40. How much extra do you pay by purchasing it on the installment plan?
3. You worked the following hours this past work week: 8.5 hrs., 10.25 hrs., 9 hrs., 6.75 hrs and 5.25 hrs.
- At Great Harvest Bread, people can be fired for regularly working more than 40 hours a week. Are you in danger of exceeding the 40 hours/week with the hours worked this week?
  - Find the average number of hours worked per day. (Round answer to one decimal place.)
4. Salespeople earn \$9.36 per hour and receive time and a half for hours over 40 per week. Sherry Berry worked 43.75 hours this week, determine her earnings. (Round answer to nearest penny.)
5. An office manager must determine the cost of carpeting the entryway. The floor requires 16.9 sq. yd. of carpet at \$22.79/sq. yd. It also requires 5.5 hours of labor at \$22.75/hour for installation. Find the total cost of the carpeting project. (Round answer to nearest penny.)

6. Six employees each work 35 hours this week and are paid the federal minimum wage of \$5.15/hour for covered, nonexempt employees. Determine the gross amount need for this weeks payroll.

### Percents

1. Find the amount of tax owed on an order of office supplies costing \$56.18 if the tax rate is 5.5%. (Round answer to nearest penny.)
2. Roger Brandin has a gross earnings of \$1,009.54 for two weeks. If Medicare tax is 1.45% of the earnings, how much is deducted for Medicare tax? (Round to nearest penny.)
3. An employee's gross earnings for a pay period are \$987.51 with the net pay of \$725.34. What percent of the gross pay are total deductions? (Round answer to nearest tenth.) [Note: Deductions = Gross pay – Net pay]
4. The “rule of thumb” for cost of employee turnover is 150% of salary. If the average salary of an employee is \$50,000 per year, determine the cost of employee turnover.

5. The Simple Investment Retirement Account (Simple IRA) plan offers Fun Company employees a unique opportunity for savings, financial growth and favorable tax treatment. Fun Co. makes matching contributions equal to 100% of elective deferrals that does not exceed 3% of annual compensation. For any year, a contributing participant's elective deferrals shall not exceed \$6,000 (indexed for cost-of-living increases according to law.)
- a. John Doe, an employee of Fun Co., defers \$4,800 per year to his Simple IRA through payroll deductions. John's annual compensation is \$35,650.
    - i. Find 3% of John's annual compensation.
    - ii. According to Fun Co.'s policy, what is the total amount the company pays in "matching" IRA contributions for John?
  - b. Jane Buck, an employee of Fun Co., defers \$2,400 per year to her Simple IRA through payroll deductions. Jane's annual compensation is \$84,000.
    - i. Find 3% of Jane's annual compensation.
    - ii. According to Fun Co.'s policy, what is the total amount the company pays in "matching" IRA contributions for Jane?
6. Matt Curtis has a monthly gross earnings of \$1,934.56. If 6.2% is paid for social security taxes and 1.45% for Medicare taxes, what is his monthly net earnings? (Round answer to nearest penny.)
7. What will you pay on a \$894.97 item advertised at 15% off? (Round answer to nearest penny.)
8. A supplier gives a 3% discount to regular customers. If the total of supplies purchased was \$1,234, how much was the discount? (Round answer to nearest penny.)

9. The morning production report indicates that eighteen whatsits were rejected from a run of 1,600. What percent of the whatsits passed inspection? (Round answer to one decimal place.)
10. The Acme Whatsits Co. weekly report showed 16,000 gizmos were produced. If the weekly production decreases by 9%, what is the new production? (Round answer to nearest whole number.)
11. At Inmo Softgoods, 3.25 yards of fabric are wasted during the cutting process from a 26.5 yard roll. Find the percent waste. (Round answer to nearest tenth.)
12. A food seasonings representative generated \$345,600 in sales last year and was paid \$43,200 in salary. If the representative's salary is figured on a commission of sales, find the percent commission rounded to one decimal place.
13. Onebad Bank wrote off \$10.7 billion worth of bad assets last year. This year it wrote off \$7 billion more than last year. Find the percent increase worth of bad assets. (Round to nearest tenth.)
14. Cindy Matthews currently earns \$31,955 annually and has received a 5.5% raise during her evaluation. What will her new annual earnings be with the raise? (Round answer to nearest dollar.)

15. A remodeling job actually cost \$5,670 and was 130% of the estimate cost. Find the estimate cost. (Round answer to nearest dollar.)
16. A manager told his employees that the production of the new product would take 12% of the total project time. If it took 32 hours to produce the product, how long was the total project? (Round answer to nearest whole number.)
17. A restaurant manager needs 150 lbs of apples. Because of spoilage and/or damage, she expects to use only 85% of the apples. What is the minimum amount she should order to guarantee the needed 150 lbs? (Round answer to nearest whole number.)
18. At Risky Realtors, Jim, the real estate salesperson, receives 65% of the 4.5% commission on a house that sold for \$75,890. How much does he earn on the sales? (Round answer to nearest penny.)
19. Laura receives \$440 per week plus a 3% commission for all sales at Lenny's TV. Last week, Laura sold \$9,950.05, how much is her weekly pay? (Round to nearest penny.)
20. A project job bid of \$9,576 had overrun costs amounting to \$766.25. What percent of the project is overruns? (Round answer to nearest tenth.)
21. An employee's gross earnings in a particular workweek are \$245.00. After deductions required by law, the disposable earnings are \$215.00. In this week, 25 percent of the disposable earnings may be garnished.

- a. Find the garnished amount of disposable earnings. (Round answer to nearest penny.)
  - b. Determine the employee's net pay after the garnished amount is deducted.
22. An employee paid every other week has disposable earnings of \$400.00 for the first week and \$50.00 for the second week of the pay period, for a total of \$450.00. In a biweekly pay period, when disposable earnings are above \$412.00 for the pay period, 25% may be garnished. It does not matter that the disposable earnings in the second week are less than \$154.50. Find the amount garnished from this employee's disposable earnings.
23. The number of Age Discrimination in Employment Act (ADEA) charges resolved during fiscal year 2003 was 17,352. This was a drop from the 18,673 ADEA charges resolved during fiscal year 2002. Find the percent decrease. (Round answer to nearest tenth of a percent.)
24. The monetary benefits in Age Discrimination Employment Act (ADEA) charges were \$55.7 million in fiscal year 2002. There was \$6.8 million dollars less in monetary benefits the next fiscal year. Find the percent decrease. (Round answer to nearest tenth of a percent.)
25. Levi T. Hillfinger, owner of a clothing-recycling business, is feeling financially squeezed so he's cutting costs by teaming up with his competitors to buy materials.

This spring the vendor who sells him steel strapping, used to wrap bales of clothing, agreed to give a discount to him and to a new customer that he would bring in. Hillfinger reduced his costs for strapping by 19% or \$1,100 an order. Find his original cost for steel strapping. (Round to nearest penny.)

26. In 2001, the cost of workers' compensation per \$100 of covered payroll in Minnesota was \$1.44. This is a \$0.12 raise in the cost from 2000.
- Find the cost per \$100 of covered payroll for 2000.
  - Find the percent increase from 2000 to 2001 for the cost of workers' compensation. (Round to nearest tenth.)
27. Excerpt from The Last Juror by John Grisham: "We sold twenty-four hundred papers the week before her death, and almost four thousand the week after." Find the percent increase in newspaper sales described in this passage. (Round to nearest tenth.)

### Measurements

- The reception area needs new carpeting. It has been calculated that 2,859 sq. ft. of carpeting are needed. Since carpet is sold in square yards, find the amount need in square yards. (Round to nearest whole yard.)
- The office manager has received two bids for carpet for the reception area. One flooring supplier bid \$39.45 per square yard while the second supplier bid \$4.25 per square foot.
  - Which is the better buy?
  - How much will be saved on 35.5 sq. yds?

3. Roofing tar costs \$11.55 per gallon. Your Canadian associate wants to know how much the roofing tar costs per liter (in American currency.) Find the cost per liter. (Round to nearest penny.)
  
4. Your Canadian associate says his company car gets 13.2 km per liter of gas. What is the fuel economy for this car in miles per gallon? (Round to nearest tenth.)
  
5. Your company produces 20-inch monitors, convert this measurement to cm for Canadian customer's information. (Round to nearest tenth.)
  
6. After a business meeting, you are discussing the recent race you attended near Omaha, Nebraska. Mid America Motorplex, in Omaha, is a 2.23 mile, 15 turn road course. Your European associates want to know how many kilometers equal the 2.23-mile track. Find the track length in km. (Round to nearest tenth.)
  
7. Your confectionary product is packaged in 12.7 oz bags, find the equivalent weight in grams. (Round to nearest whole gram.)
  
8. As a special promotion, you are putting your carbonated beverage in a 17 fl oz bottle, find the equivalent volume in ml. (Round to nearest whole ml.)
  
9. In England, fruit flavored Bugs & Grubs candy comes in 100 gram boxes priced at £0.65. Find the US dollar cost per pound for this candy if one Great British Pound (£1.0) equals \$1.79760 US dollars.

## Formulas

1. Find the interest on a loan of \$8,100 if the annual interest rate is 6.5% and the loan is for 9 months. (Recall,  $I = PRT$  where I-interest, P-principal, R-rate in decimal form and T-time in years.) (Round answer to nearest penny.)
2. The principal amount of a loan is \$2,100 and the interest rate is 9.1%. If the loan is paid in 3 months, find the interest. Note:  $I = PRT$ . (Round answer to nearest penny.)
3. What is the interest on a short-term loan for \$2,300 at 12.9% interest paid in 6 months? Note:  $I = PRT$ . (Round answer to nearest penny.)
4. What is the interest rate on an account with a principal of \$4,100, interest equaling \$395 for five years? ( $R = I/(PT)$ , where I-interest, P-principal, T-time and R-rate. Note: R-rate is given as a decimal and will need to be converted to an equivalent percentage.) (Round answer to two decimal places.)
5. A certificate of deposit with a principal of \$20,000 earns \$620.47 interest during two years. Find the interest rate. Note:  $R = I/(PT)$  (Round answer to two decimal places.)
6. One way in which an owner of a shop can evaluate the success of its business is to keep track of “production per square foot.” To calculate this indicator, total revenue is divided by the area (in square feet) of the shop. If a 2,845-sq. ft. shop generated total revenue of \$654,321, determine the production per square foot. (Round answer to nearest dollar.)

7. Outtold stock sells for \$20.63 per share. The company has a \$1.10 per share earning. Find the company's price to earning ratio by dividing the price per share by its earning per share. (Round answer to two decimal places.)
  
8. If you earn \$924.19 for a 35-hour work week, how much would you earn for a 40-hour work week at the same hourly rate? (Round answer to nearest penny.)
  
9. A machine can produce 15 parts in 50 minutes. How many parts can the machine produce in 7 hours?
  
10. If 12 line workers can complete an order in 5 hours, how long will the same order take if there are only 8 line workers?
  
11. A foundry can complete a job using four machines in 6 hours. If the same size job must be finished in 2 hours, how many machines should be used to get the job done?
  
12. Seven presses can complete a certain order in 6 hours, if two presses are taken off line, how long will it take the remaining presses to complete the same order? (Round to nearest tenth.)
  
13. If you received \$329.06 for 13  $\frac{1}{2}$  hours, what should you expect to receive for 35 hours of work at this same pay rate? (Round to nearest penny.)

14. At your company, paid vacation is available to regular full-time and regular part-time employees following their first-year anniversary and is provided based on the following calculations: During the first 2 (two) years of employment, vacation time will be earned at the rate of 0.0192 hours per hour worked. During the 3<sup>rd</sup> (third) through 5<sup>th</sup> (fifth) years of employment, paid vacation time will be earned at the rate of 0.0384 hours per hour worked. During the 6<sup>th</sup> (sixth) and following years of employment, vacation time will be earned at the rate of 0.0586 hours per hour worked. (Round answers to nearest hour.)
- Find earned vacation for Employee A who works 72 hours every two weeks this past year and is in his fifth year of employment.
  - Find earned vacation for Employee B who works 40 hours every week, working 48 weeks and has been with the company 1 year.
  - Find earned vacation for Employee C who works 35 hours every week, for 50 weeks and has been with the company 19 years.
15. An employee on a \$350.00 weekly draw against commissions has disposable earnings each week of \$305.00. Commissions, paid monthly, total \$2,200.00 for March after deductions required by law. Each draw and the balance due at the monthly settlement are separately subject to the law's restrictions. Thus, 25% of each draw may be garnished. (Garnish amount = disposable income x rate)
- Find the weekly garnished amount. (Round to nearest penny.)
  - Determine the disposable income for one month. (Monthly Disposable Income = Weekly Disposable Income x 4 )
  - Find the balance of pay subject to garnishment. (Balance Pay = Commissions – Monthly Disposable Income)
  - Determine the 25% garnishment on the balance pay.

16. A tipped employee engages in an occupation in which he or she customarily and regularly receives more than \$30 per month in tips. An employer of a tipped employee is only required to pay \$2.13 per hour in direct wages if that amount combined with the tips received at least equals the federal minimum wage (\$5.15/hour.) If the employee's tips combined with the employer's direct wages of at least \$2.13 per hour do not equal the federal minimum hourly wage, the employer must make up the difference.

You are the manager of Mama's Café, below are the weekly hours and tips reported by the wait staff. Calculate total earnings for each employee. Determine whether each has received at least the minimum hourly wage. If an employee has not received the minimum hourly wage, find the amount of money needed to be paid by the employer.

$$\text{Total Earnings} = \text{Hrs. worked} \times \$2.13 + \text{Tips}$$

$$\text{Ave. Hourly Wage} = \text{Total earnings} / \text{hrs. worked}$$

$$\text{Employer Pay Obligation} = \text{Hrs. worked} \times \$5.15 - \text{Tips}$$

Monthly	Hours	Tips	Total Earnings	Ave. Hourly Wage	Employer Pay Obligation
<b>Nora</b>	25	\$112.75			
<b>James</b>	36	\$141.25			
<b>Beth</b>	24	\$37.75			
<b>Mike</b>	31	\$82.01			

17. The food cost percentage can be calculated using the following formula:

$$\text{Food Cost Percentage} = (\text{Cost of Purchased Food} / \text{Total Revenue}) \times 100$$

A company's food service has a total revenue of \$35,050 for the prior month and a food cost of \$17,500 for the same month. Using the formula above, find the food cost percentage. (Round to nearest tenth.)

18. Use the following 2001 injury claims from Wisconsin Department of Workforce Development to find the average indemnity cost per claim for each county listed. (Average indemnity cost per Claim = Lost Wage Compensation / Claims) (Round to nearest dollar.)

County of Injury	Claims	Lost Wage Comp.	Ave. Cost/Claim
Crawford	174	\$1,002,801	
Dane	3,673	\$13,927,310	
Grant	258	\$1,135,282	
Iowa	101	\$414,438	
LaFayette	51	\$319,926	
Milwaukee	8,580	\$43,756,522	
Richland	103	\$359,662	
Sauk	532	\$2,851,036	
Vernon	88	\$293,928	

Data

1. Using Excel, make a bar graph to represent the following information:

Equal Pay Act Charges		
Fiscal Year	Receipts	Resolutions
1992	1294	1185
1993	1328	1120
1994	1381	1171
1995	1275	1249
1996	969	1235
1997	1134	1172
1998	1071	1134
1999	1044	1026
2000	1270	1235
2001	1251	1158
2002	1256	1182
2003	1167	1071

Source: <http://www.eeoc.gov/stats/epa.html>

2. Using Excel, make a line graph from the following data:

<b>Equal Pay Act Charges</b>	
Fiscal Year	Monetary Benefits (Millions)*
1992	\$2.2
1993	\$2.4
1994	\$2.8
1995	\$2.8
1996	\$1.9
1997	\$2.4
1998	\$2.7
1999	\$2.9
2000	\$3.6
2001	\$5.1
2002	\$10.3
2003	\$3.4

\*Does not include monetary benefits obtained through litigation.

Source: <http://www.eeoc.gov/stats/epa.html>

3. Using Excel, make a circle graph to represent the following information:

<b>2004 Projected Revenue Growth</b>	
Gen. State Aid	\$150,000
Tax Levy	\$236,000
Tuition	\$174,000
State Grant	\$140,000
Institutional Funding	\$100,000
Source: SWTC, S. Hollmann, 4/30/04	

## Statistics

1. Sports Shop spent the following amounts on advertising during the last six months.

July	\$807.61	August	\$950.21	September	\$863.99
October	\$980.55	November	\$909.59	December	\$1,283.65

- a. Find the mean monthly advertising expense. (Round to nearest penny.)
- b. Find the median monthly advertising expense. (Round to nearest penny.)
2. Listed below are 2002 average salaries by industry for design and development engineers and managers.

Computers	\$98,824
Components & Subassemblies	\$96,686
Communications	\$93,442
Military/Aerospace	\$86,938
Test & Measurement	\$84,780
Medical Electronics	\$84,310
Consumer Electronics	\$83,636
Industrial Controls	\$79,006
Consultants	\$76,763
Automotive	\$74,142

Source: EE Times, 08/28/03

- a. Find the mean salary. (Round to nearest dollar.)
- b. Find the standard deviation. (Round to nearest dollar.)
- c. 99.7% of the salaries run between \_\_\_\_\_ & \_\_\_\_\_

3. Listed below are 2002 Wisconsin workers compensation injuries involving caught in or between.

Type	Cost per Claim
Caught in, under or between	\$4,987
Collapsing materials (slides of earth)	\$33,407
Machine or machinery	\$5,121
Object handled	\$2,477

- a. Find the mean cost per claim.
- b. Find the median cost per claim.
4. Listed below are the 2002 Wisconsin workers compensation due to “struck or injured by” causes.

Type	Cost Per Claim
Falling or flying object	\$4,891
Hand tool or machine in use	\$4,802
Motor vehicle	\$6,494
Object handled by others	\$6,712
Person-fellow worker (not in act of crime)	\$2,887
Struck or injured by	\$6,824

- a. Find the standard deviation. (Round to nearest dollar.)
- b. 68% of the cost per claims run between \_\_\_\_\_ & \_\_\_\_\_

### Finance

1. Joan Inmo borrowed \$25,000 for 3 years at 6.25% to start up Inmo Softgoods.
- a. Find the total interest owed if loan is calculated using simple interest. (Note:  $I = PRT$ )
- b. What is the total amount Joan will pay the bank?
- c. What will be Joan’s equal monthly payments? (Round to nearest penny.)

2. Calculate the cost of employee turnover using the following information:

	Time	Charge	Cost
<b>Separation Costs</b>			
Cost of exit Interviewer's time	1 hour	\$18/hr	
Cost of terminating employee's time	30 minutes	\$9.50/hr	
Cost of administrative functions related to termination	2 hours	\$12/hr	
Separation pay	1 week	\$320/wk	
Increase in unemployment tax			\$272.00
<b>Vacancy Costs</b>			
Cost of additional overtime	60 hours	\$14.25/hr	
Cost of additional temporary help	40 hours	\$11/hr	
Wages/benefits saved due to vacancy	120 hours	(\$9.50)	
<b>Replacement Costs</b>			
Pre-employment administrative expenses	3 hours	\$12/hr	
Cost of attracting applicants (ads, agencies, etc.)			\$162.00
Cost of entrance interviews	5	\$16/interview	
Testing costs (aptitude, skill, drug)	1 hour	\$46/hr	
Staff costs (staff meetings--one 30 min. with 3 people)	1.5 hours	\$16/hr	
Travel and moving expenses	0	\$1500/employee	
Post-employment information gathering & dissemination costs	2 hours	\$14/hr	
Post-employment information gathering & dissemination costs	2 hours	\$9.50/hr	
Cost of post-employment medical exams	1	\$75	
<b>Training Costs</b>			
Cost of informational literature	1	\$50	
Informal training costs	1 day (8 hrs)	\$25.50/hr	
<b>Total Turnover Costs per Employee</b>			

3. Complete the purchase order for Harlem's Furniture & Appliance.

Harlem's Furniture & Appliance Somewhere, WI			
Customer: Your Own Business, Fennimore, WI			
Qty	Item	Unit Price	Amount
9	desks	\$541.00	
18	4-dr. files	\$148.50	
9	chairs	\$219.00	
9	mats	\$91.50	
		<b>Subtotal</b>	
		<b>15% Discount</b>	
		<b>Tax (5.5%)</b>	
		<b>Shipping</b>	
		<b>Total</b>	

Shipping	
\$0-\$500	\$47.50
\$501-\$2,500	\$125.00
\$2,501-\$5,000	\$195.00
\$5,001+	\$275.00

4. Harlem's Furniture & Appliance has the following terms: 2/10, net 30. Find the amount due on this purchase in problem #3 if the bill is paid within 10 days. (Round to nearest penny.)
  
5. The Dress4Success clothing store purchased suits each for \$350 and marked them up 65%. Find the selling price. (Round to nearest penny.)
  
6. The Dress4Success clothing store's selling price for a pinstripe suit is \$648. The markup is \$243.
  - a. Find the cost of the suit.
  
  - b. Find the markup rate. (Round to nearest tenth.)

7. The selling price of a silk tie is \$79. The Dress4Success's cost was \$49.
  - a. Find the markup.
  
  
  
  
  
  
  
  
  
  
  - b. Find the markup rate. (Round to nearest tenth.)

### Algebra

1. A computer repair technician charges \$52 for a service call plus \$28.50 per hour of work. The formula  $C = 52 + 28.50H$  represents the total charge,  $C$ , for  $H$  hours of work. If a bill totals \$180.25, find how many hours of labor were charged. (Round to the nearest tenth.)
  
  
  
  
  
  
  
  
  
  
2. Benny, June, and Johnny are partners in a consulting business. Because of the differences in their contributions, it was decided that June's share of the profits will be twice as much as Benny's share, and Johnny's share will be three times as much as Benny's share. How should a profit of \$97,190 be divided among the three partners? (Round answer to nearest penny.)