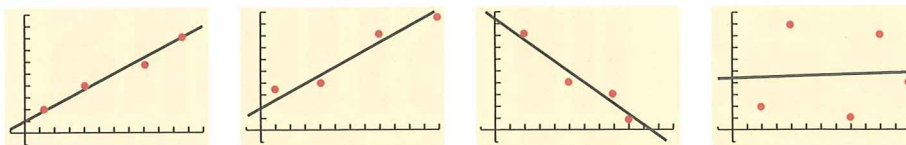


ALGEBRA REFRESHER

A *scatter plot* is a graph of several points. Four scatter plots are shown below. A *line of best fit* is superimposed on each graph.



A *line of best fit* is the straight line that is closer to all the points than is any other line you might draw. The *correlation coefficient* r is a number between -1 and 1 that indicates how good the fit is. If r is 1 or -1 , then the fit is perfect. If r is close to 1 or -1 , the fit is good. If r is 0 or near 0 , then the fit is poor.

Graph the table of values at the right as a scatter plot. Then graph the equations of Exercises 1–3 over the scatter plot and tell whether you think the fit of each line is *poor*, *good*, or *excellent*.

x	0	1	3	5	7
y	0	2	4	6	7

1. $y = 0.5x + 2$ 2. $y = -0.2x - 2.5$ 3. $y = x + 0.5$

A graphing calculator can be used to find an equation of a line that best fits a scatter plot. The calculator will give you values for a and b in the *linear-regression equation* $y = a + bx$. It will also give you the correlation coefficient for the line.

Write an equation for a linear-regression equation that corresponds to the given calculator display. Round the constants to the nearest hundredth.

Example $a = -0.136986$
 $b = 3.260274$
 $r = 0.973955$

Solution $y = 3.26x - 0.14$

- | | |
|---|---|
| <p>4. $a = 0.486765$
 $b = 2.242647$
 $r = 0.837326$</p> | <p>5. $a = 1.186441$
 $b = -3.067797$
 $r = -0.993112$</p> |
| <p>6. $a = 0.612805$
 $b = 0.484756$
 $r = 0.474731$</p> | <p>7. $a = 4.254237$
 $b = 1.271186$
 $r = 0.159854$</p> |

8. In Exercises 4–7, which line is the best fit for its scatter plot? Which line is the poorest fit?
9. Use a graphing calculator to find the linear-regression equation for the scatter plot of Exercises 1–3.

Investments

IN STOCKS AND BONDS

WALL STREET IS MORE THAN A PLACE, FOR MANY OF us, Wall Street represents wealth. It is an arena in which millions of dollars circulate every day. Portions of companies, even whole companies, are bought and sold to other companies and to wealthy investors, and the money flashes by as numbers on computer screens.

Many companies, however, are also owned by thousands of individual stockholders, including wage-earning investors. Companies with over 100,000 stockholders include Westinghouse, Atlantic Richfield, Eastman Kodak, Texaco, Chrysler, Occidental Petroleum, Mobil, Ford, Sears, and Southwestern Bell, to name a few.

Some of the students whom we have met in earlier chapters will investigate various aspects of stock investments. They will study the differences among stocks, bonds, and mutual funds and how these investments compare with money that is kept in a savings account. They will also examine some of the ways to avoid risky investment schemes.

8-1 Stocking Up

8-2 Commissions and Stocks, Bonds, and Mutual Funds

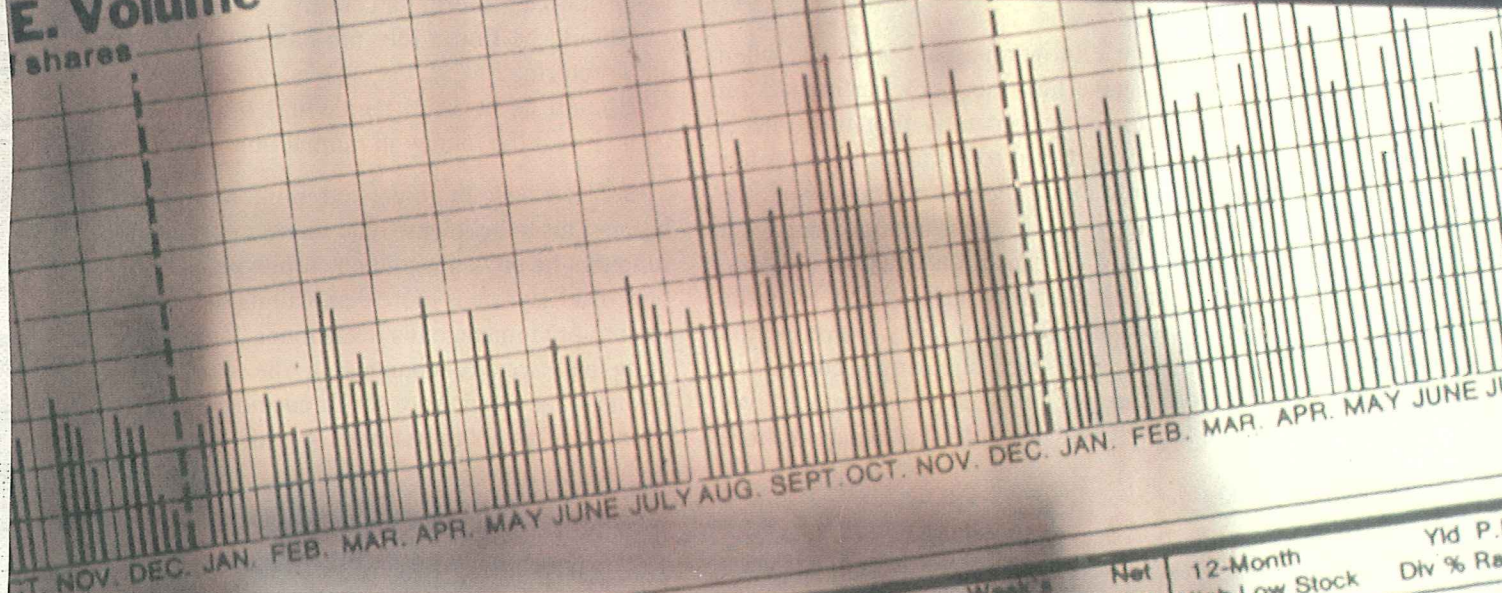
8-3 Investment Pros and Cons

8-4 Stock Prices and Inflation

New York Stock Exchange

WALL STREET

E. Volume
shares



Week's	Net Chg	12-Month High Low Stock	Yld Div %	P.E. Ratio	Sales hds.	Week's High Low Last Chg	Net Last Chg	12-Month High Low Stock	Yld Div %	P.E. Ratio
30	14	AtlasCp	.50	2.2	4					
47 1/2	25 1/2	Augat	.32	7	40					
48 1/2	23 1/2	AutoOt	.56	1.5	20					
			.20	3.5	10					



Jeff owns some stock that his grandfather bought for him when Jeff was three years old. Granddad retired seven years ago from a large engineering firm that offered stock ownership in the company as part of the employee benefit plan. Granddad had also been able to buy some of the shares for Jeff as a way of saving toward his college costs.

Jeff didn't know much about stocks when Granddad gave him the stock certificates on his 16th birthday, but now that the time is approaching for him to go to college, he has become more interested. Four times a year, the engineering company sends him payments that his father told him are called *dividend checks*. Although the amounts have varied over the years, Jeff notices that they have added significantly to his new checking account.

Stocks are not Jeff's only investment. Ever since he was five years old, Jeff's parents have

bought him a \$50 U.S. savings bond every month. Jeff is not sure that these investments will cover the high costs of his college education. He is asking himself questions such as the following.

Will he need to continue working this summer tutoring algebra?

Should he find a job that pays more than tutoring?

Should he cash in the savings bonds and invest the money in mutual funds?

Jeff has become interested in mutual funds because his father owns some shares in a mutual fund that he buys through an employee benefit plan. Dad says he is more than willing to let the mutual fund manage his investments, since the daily and weekly changes in the world of business and finance are so varied and complex that he prefers not to be bothered with them.

OBJECTIVES: *In this lesson, we will help Jeff to:*

- *Examine several types of investments, including stocks, bonds, and mutual funds.*
- *Calculate the number of bonds or shares of stock an investor can buy at a specified price.*
- *Read and understand daily stock and bond transactions in the newspaper.*

STOCKS

Jeff's stock certificates, called simply **shares** or **stock**, represent ownership in a **corporation**, a form of business organization that people beginning a business very often choose because it limits the liability of its owners, the **shareholders**. If the corporation is successful, Jeff will take part in its success through **dividends** (the periodic payments that a corporation distributes to its stockholders). The dividends from Granddad's company are declared four times a year.

Granddad and Jeff may also make money on their stock through an increase in the market value of the shares of stock. Such an increase in value, called a **capital gain**, will normally occur if a company increases its profits. On the other hand, if the corporation is not successful, it may have to reduce or eliminate its dividends, and the value of the stock may decrease. Then all



of the shareholders such as Granddad and Jeff could even lose part or all of their investment.

A corporation always issues *common stock* (like Jeff's) and may also issue *preferred stock*.

Common Stock The owners of **common stock** of a corporation are entitled to elect a board of directors and to receive any dividends that the board declares. However, a corporation's board can choose not to declare a dividend. This may occur if a corporation has poor earnings. Sometimes, even a profitable corporation will pay little or no dividends in order to have funds for research or expansion. In that case, shareholders will expect to see the value of their shares increase to compensate for the lack of dividends.

Preferred Stock Like owners of common stock, owners of **preferred stock** have a share in the ownership of a corporation. However, they usually do not have a right to vote in the election of corporate directors. Unlike the holders of common stock, they are entitled to a specified, fixed dividend. If the company encounters financial difficulty, all preferred shareholders must be paid before any dividends are declared on the common stock.

Newspaper Stock Listings Newspapers print closing stock and bond prices for the previous trading day along with other information about the stock or bond, such as the volume of trading. A typical line from a stock table is shown below in simplified form. It shows how the stock price for Growth Company of America performed the previous day.

52-Week		Stock	Div	High	Low	Last	Change
High	Low						
$35\frac{3}{4}$	$19\frac{3}{4}$	GrowCo	1.10	$22\frac{1}{8}$	$21\frac{5}{8}$	22	$+\frac{1}{4}$

The abbreviated name of this company, GrowCo, appears in column three. The first two columns show the highest and lowest prices at which GrowCo traded during the previous 52 weeks (\$35.75 and \$19.75, respectively). After the name of the stock comes the annual per-share dividend of \$1.10. Yesterday's high and low price are shown next. Finally, the day's closing price appears along with the price change for the day. In this case the stock price for GrowCo varied between $21\frac{5}{8}$ and $22\frac{1}{8}$ (\$21.625 and \$22.125), ending the trading session at \$22; this was up $\frac{1}{4}$, or 25 cents, from the previous day's closing price of \$21.75.

BONDS

When you buy a **bond**, you are lending money to either a corporation or a government body, such as a city, state, county, or independent agency. The **face value of a bond** is the original loan amount that appears on the bond, usually a multiple of \$1000. In return for your money you get three things:

1. The bond issuer's promise to pay you back the entire face value
2. A maturity date, which is the earliest date when the bond will be redeemed
3. A promise to pay interest at a specified interest rate on the face value

For example, if you buy a “\$1000 Joy $8\frac{1}{8}\%$ 14” 20-year bond from Joy Motor Company in 1994, you will be paid an annual interest rate of $8\frac{1}{8}\%$, or \$81.25 per \$1000, until the year 2014. On the date of maturity (sometime in 2014), Joy will pay back the \$1000. If you decide to sell the bond before the maturity date, it will probably be worth either more or less than the face value, depending on the prevailing interest rate for all similar bonds at the time you choose to sell.

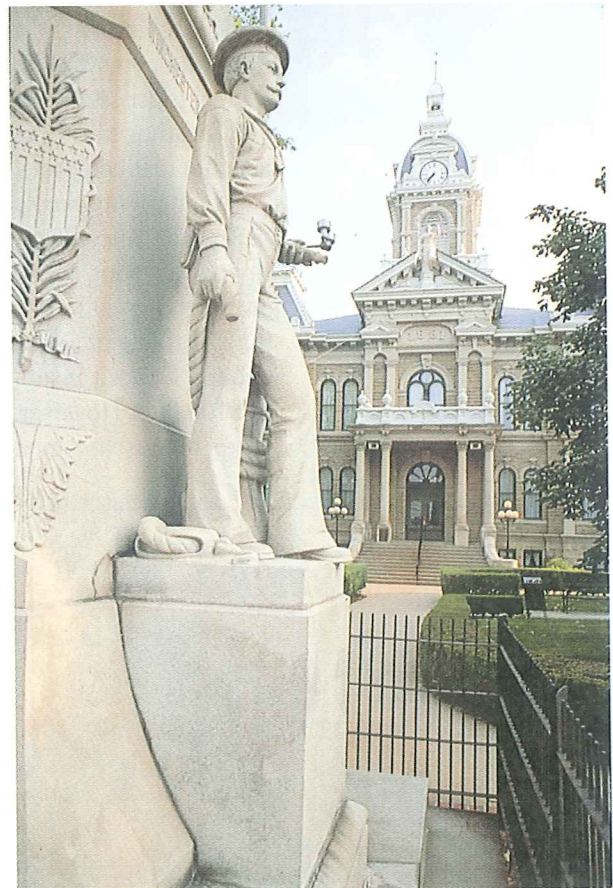
Corporate Bonds Private companies issue **corporate bonds** to raise money for plant expansion or other company purposes. If a corporation’s earnings are not great enough to cover its obligations to both stockholders and bondholders, then the bondholders have priority. All bond interest must be paid before any dividends can be paid to the stockholders.

Municipal Bonds States, cities, counties, school districts, and other governmental bodies issue **municipal bonds** to raise money for schools, hospitals, streets, and so forth. They are usually partially or totally exempt from local and federal income taxes.

U.S. Savings Bonds Jeff’s parents have purchased over \$6000 in **U.S. savings bonds** for him. Like many other Americans, they take advantage of the payroll savings plan that allows individuals to buy a bond each month through a payroll deduction.

U.S. savings bonds are backed by the power of the federal government to tax and the country’s faith in the government to pay its debts. However, such bonds are sometimes criticized because bondholders have to pay for their exceptional safety by accepting a relatively low rate of interest. If a savings bond is lost, stolen, or destroyed, the bondholder may be able to have it replaced by the government if he or she can supply evidence of actually owning the bond.

U.S. savings bonds have one additional important advantage; there are no transaction costs such as commissions to a broker. Unless you are purchasing a large number of bonds that you plan to hold for many years, the large commission that you pay may severely reduce or even wipe out the interest that you get from a bond that is not a savings bond.



MUTUAL FUNDS

The company at which Jeff’s father works assists its employees in buying mutual funds. A **mutual fund** is a means of pooling funds with thousands of other people to acquire a wide variety of stocks, bonds, and other types of investments. This way of investing appeals particularly to small investors, such

as Jeff's father, who do not have enough money to **diversify** (buy a well-balanced assortment of investments) or enough knowledge to make sound stock and bond investment decisions.

When investors buy shares from a mutual fund company, the company uses that money to purchase stocks, bonds, and similar **securities**. Thus, instead of investing \$1000 in a particular corporation, Jeff's father can buy \$1000 worth of shares in a mutual fund and have a stake in perhaps 100 or more different corporations.

BEFORE YOU INVEST . . .

Jeff wants to invest in stocks either directly or indirectly through a mutual fund. However, he also remembers something his grandfather told him: "Buying stocks or mutual fund shares should be part of your long-term investment program, but first be sure that you have a savings account or a reputable money-market account that equals at least six months of your living expenses." Jeff has a savings account at his local bank but was unfamiliar with money-market funds. Jeff's father told him that a **money-market account** was similar to a NOW account that combines the features of a savings and checking account.

A money-market account can be opened with a mutual fund group or with a bank. The interest received on a money-market account is higher than on a savings account, but the account usually has certain restrictions such as requiring any withdrawal to be at least \$500 or limiting the number of withdrawals that may be made in a month. If you open such an account at a bank insured by the Federal Deposit Insurance Corporation (FDIC), your account will be insured up to \$100,000. However, the interest will be less than you get from a mutual fund group because the money-market fund at the mutual-fund group is not insured by

the federal government. These uninsured money-market funds are generally regarded as reasonably safe, but you should investigate the background of the mutual fund group before sending it any money.

Jeff decided to follow his Granddad's advice. In addition to the savings account he already has, he opened a money-market account at the bank and will bring his combined savings in the two accounts to a half year of living expenses before he invests in stocks or a mutual fund.

Ask Yourself

1. What is your relationship to a company when you buy its stock?
2. What is your relationship to a company when you buy its bond?
3. What is the main difference between buying a mutual fund and buying a stock?

ALGEBRA REVIEW

Solve for x .

1. $2650 = 42.50x$

2. $19.875x = 1700$

3. $25.375x = 8764$

4. $112\frac{1}{2} = x + 108\frac{3}{4}$

5. $x - \frac{7}{8} = 5\frac{1}{4}$

6. $x + 34\frac{5}{8} = 35\frac{1}{2}$

SHARPEN YOUR SKILLS

SKILL 1

Stock prices are quoted in fractional parts of a dollar. This means that

$$\$0.25 = \frac{1}{4} \quad \$0.50 = \frac{1}{2} \quad \$0.75 = \frac{3}{4}$$

To determine what $\frac{1}{8}$, $\frac{3}{8}$, $\frac{5}{8}$, and $\frac{7}{8}$ are equivalent to in dollars, divide the numerator by the denominator.

$$\frac{1}{8} = 0.125 \quad \frac{3}{8} = 0.375 \quad \frac{5}{8} = 0.625 \quad \frac{7}{8} = 0.875$$

EXAMPLE 1 Jeff would like to cash in his U.S. savings bonds. He has \$2200 in savings bonds that have matured.

QUESTION How many shares could he buy of a stock that is selling for $33\frac{3}{8}$ dollars per share? Disregard transaction costs such as commissions.

SOLUTION

The price of one share of the stock is $33\frac{3}{8}$, or \$33.375. To find how many shares of stock Jeff can buy, divide the amount that he has (\$2200) by the price per share (\$33.375).

$$2200 \div 33.375 = 65.917603$$

Jeff knows that he cannot buy a part of a share of stock, so he drops the decimal portion of the number. Jeff can buy 65 shares of the stock (before transaction costs). The shares will cost $65 \cdot 33.375 = \$2169.38$. Notice that you must use the fractional portion of a cent to find the cost that is rounded to the nearest cent.

SKILL 2

Bond prices that appear in the newspaper bond tables are somewhat misleading, since they show the true price *divided by 10*. Thus a price of $104\frac{1}{2}$, or 104.5, actually refers to a bond that has a market price of \$1045.

EXAMPLE 2 The bond table in the newspaper shows that a high quality corporate bond is selling at $104\frac{1}{2}$.

QUESTION How many corporate bonds could Jeff buy with the \$2200 from his U.S. savings bonds? Disregard transaction costs such as commissions.

SOLUTION

To find how many bonds Jeff can buy, divide the amount that he has by the price of one bond.

$$2200 \div 1045 = 2.105 \quad 104\frac{1}{2} \cdot 10 = 1045$$

Jeff cannot buy a part of a bond, but he can buy two bonds. The two bonds will cost $2 \cdot 1045 = \$2090$. Jeff probably would not purchase the bond because of the high commission cost.

SKILL 3

EXAMPLE 3 Jeff has been reading the financial section of the newspaper to learn how the prices of stocks are reported. Following is a partial listing of stock transactions for one day.

52-Week		Stock	Div	High	Low	Last	Change
High	Low						
$53\frac{1}{4}$	$39\frac{1}{2}$	BlcInc	1.25	$41\frac{1}{2}$	$40\frac{3}{4}$	41	$-\frac{1}{4}$
163	$135\frac{1}{4}$	BxCo	2.00	$137\frac{1}{4}$	$136\frac{3}{4}$	$137\frac{1}{4}$	$+\frac{3}{4}$
$4\frac{3}{4}$	$2\frac{1}{4}$	Maldmer		$2\frac{5}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$+\frac{1}{8}$
$12\frac{3}{4}$	$7\frac{5}{8}$	TemCont	0.75	$11\frac{1}{8}$	11	$11\frac{1}{8}$	$+\frac{1}{4}$

QUESTIONS

1. What was the closing price for TemCont?
2. What was the highest price at which BlcInc traded?
3. How much did BxCo stock vary during trading?
4. How does BxCo's closing price compare with its closing price for the previous trading session?
5. What was the closing price of BxCo at the end of the previous trading session?
6. What is the annual dividend per share paid by BlcInc?
7. What would your annual dividend income be from 100 shares of BlcInc?
8. Which companies closed at their high prices for the day? Which did not?
9. What is the highest price at which Maldmer has traded in the previous 52 weeks? What is the lowest price?

SOLUTIONS

1. $11\frac{1}{8}$ (or \$11.125)
2. $41\frac{1}{2}$ (or \$41.50)
3. $137\frac{1}{4} - 136\frac{3}{4} = \frac{1}{2}$
4. $\frac{3}{4}$ of a point (75 cents) higher
5. $137\frac{1}{4} - \frac{3}{4} = 136\frac{1}{2}$
6. \$1.25
7. $100 \cdot 1.25 = \$125$
8. TemCont, BxCo, and Maldmer closed at their high for the day; BlcInc did not.
9. $4\frac{3}{4}$ is the highest price at which Maldmer has traded in the previous 52 weeks; $2\frac{1}{4}$ is the lowest.

In this lesson, the effect of transaction costs has been ignored. These include transfer fees, which are usually very small, and the commission that you pay the broker when you buy or sell. The effect of commissions on your stock price is considered in the next lesson.

TRY YOUR SKILLS

Use the following prices per share to find the number of shares of stock you can afford to purchase if you have \$50,000 to invest in each of the following companies. Also, find the total cost of the shares. Remember that you cannot purchase part of a share of stock. Ignore transaction costs such as brokerage commissions.

	Company	Price per Share	Number of Shares	Total Cost
1.	AdoreMin	$6\frac{1}{2}$	7692	
2.	ATR	$24\frac{7}{8}$		\$49,998.75
3.	AcnInc	$9\frac{1}{8}$		
4.	AcmeAI	$10\frac{3}{4}$		

5. How many bonds can you buy with \$50,000 if the price of a bond is $97\frac{1}{2}$?
6. AdoreMin's closing price for the day is $6\frac{5}{8}$, $\frac{1}{2}$ point lower than yesterday. What was yesterday's closing price?
7. The annual dividend for ATR is \$1.33 per share. What is the dividend income on 490 shares?

EXERCISE YOUR SKILLS

KEY TERMS

bond
 capital gain
 common stock
 corporate bonds
 corporation
 diversify
 dividends
 face value of a bond
 money-market account
 municipal bonds
 mutual fund
 preferred stock
 securities
 shares
 shareholders
 stock
 U.S. savings bonds

1. What is the risk involved in buying stocks?
2. Who is more likely to realize a capital gain, the owners of common stock or the owners of preferred stock? Why?
3. For what purposes might your city or town raise money by issuing municipal bonds for sale?

Use the following prices per share to find the number of shares of stock you can afford to purchase if you have \$50,000 to invest in each of the following companies. Also find the total cost of the shares. Ignore transaction costs such as brokerage commissions.

	Company	Price per Share	Number of Shares	Total Cost
4.	Aber&Son	56		
5.	AceText	$8\frac{7}{8}$		
6.	AmerScCo	$10\frac{5}{8}$		
7.	AmerTool	90		
8.	AyerHrd	$3\frac{1}{4}$		
9.	Babbage	$74\frac{1}{2}$		
10.	BLTInc	$53\frac{5}{8}$		

11. Jeff has \$3400 that he can invest in either a growth stock that is trading at \$70 per share or a high-quality bond that pays interest of 5.8% and matures in the year 2010. Which would be a more suitable investment for him? Explain your answer.

Use the following portion of a table of stock transactions to answer Exercises 12–20.

52-Week							
High	Low	Stock	Div	High	Low	Last	Change
$57\frac{3}{4}$	$40\frac{3}{4}$	LollPp	1.42	$41\frac{3}{8}$	41	$41\frac{1}{4}$	$-\frac{1}{8}$
$49\frac{7}{8}$	$29\frac{3}{8}$	LukInd	0.97	30	$29\frac{5}{8}$	$29\frac{5}{8}$	—
$91\frac{1}{8}$	67	MamaMi	2.24	$81\frac{3}{4}$	$80\frac{1}{4}$	$81\frac{1}{4}$	$-\frac{1}{4}$
24	$15\frac{5}{8}$	NajiCo	0.46	$17\frac{3}{4}$	$17\frac{3}{8}$	$17\frac{5}{8}$	$-\frac{1}{8}$
$36\frac{3}{8}$	22	Nollnc	0.64	$24\frac{1}{4}$	$23\frac{7}{8}$	$24\frac{1}{4}$	$+\frac{1}{4}$

12. Which stock finished up for the day?
13. Which stock closed at the same price at which it closed at the previous trading session?
14. How much did NajiCo vary during the day?
15. Which stock varied by exactly $1\frac{1}{2}$ during the day?
16. What is the difference between the closing price of NajiCo for the day and the closing price for the previous trading session?

17. By how much does LollPp's closing price differ from its high for the last 52 weeks?
18. Which stock closed exactly 2 points above its low for the last 52 weeks?
19. If you had 100 shares of NolInc, how much would you receive in dividends in 1 year?
20. Which stock pays the highest dividend?

MIXED REVIEW

A restaurant is advertising for a cashier in the local newspaper. The job is for an 8-hour day, 5 days per week. There is a 2-week paid vacation each year. Find the weekly and yearly earnings for the given hourly rate.

1. \$7.50 2. \$8.25 3. \$9.00
4. Find the simple interest earned in 3 years on \$890.00 at the annual rate of 7%.

Use a spreadsheet program to fill in the missing entries from the table below that shows the activity in Victor's VISA account over a period of 3 months. The account carries a monthly interest charge of 1.5% and Victor makes monthly payments of 10% of the amount owed to the nearest dollar.

	Month	Purchases	Balance	Interest	Amount Owed	Payment
5.	1	0.00	\$624.50			
6.	2	\$92.00				
7.	3	0.00				

8. Find the total interest paid in the 3-month period.
9. Alice is considering renting a piano on a rent-to-own credit plan that allows her to rent the piano for \$200 per month for 24 months. If she decides to buy the piano, the rental fees will be applied to cover the entire purchase price. How much will the piano cost under this plan?
10. Suppose that Alice purchases the piano of Exercise 9 for \$4,000 on an installment loan with monthly payments at 10% annual interest over 2 years. Is this a better deal than the rent-to-own plan? Explain.

Use the Income Tax Withholding Table in the Reference Section to find the take-home pay for the given wages and withholding allowances. Assume that the person is single. The FICA withholding is 7.65% of gross pay.

	Monthly Salary	Withholding Allowances	Take-home Pay
11.	\$1540	0	
12.	2750	1	
13.	4130	3	



Maria has continued to save money. Recently, she has been wondering whether she should invest in the stock market or a mutual fund to make more money than she can get in a savings account. Maria has a good friend, Cal, whose father, Clarence Sr., has owned thousands of shares of stock in various companies.

Sometimes Clarence Sr. has done really well in the market, and sometimes he hasn't. Cal still talks about October 19, 1987, known as Black Monday in business circles. The Dow Jones average dropped 508 points that day, losing 22.6% of its value. Cal's father lost money in that crash. The market did rebound eventually and had record highs within a couple of years. But that was too late for Clarence Sr.

As a result of financial difficulties caused by the crash, Cal's family had to sell its large home in the expensive part of town and buy a much smaller house in a suburb farther away from the city. Clarence Sr. also sold his luxury car and bought a used one inexpensively from the car dealership that he owned. Cal himself had to give up his vision of having his own car when he reached 17.

Maria wonders how investing in stocks can cause such an upheaval in a family. She is aware of how stock prices and mutual fund prices can vary but believes that she could choose some fine companies or a good fund to invest in if she had the money to invest. Maria will find out how stocks and mutual funds are bought and sold as well as other things that she needs to know if she is considering investing real money.