

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 NollInc, 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.

OBJECTIVES: In this lesson, we will help Maria to:

- Discover what factors must be considered before deciding to buy stocks or a mutual fund.
- Understand the process that takes place when stocks are traded.
- Calculate profit or loss from buying and selling shares of stock.
- Understand how transaction costs affect the value of stock or mutual fund investments.

SHOULD I INVEST IN THE STOCK MARKET?

Clarence Sr. watched his acquaintances acquire large sums of money by “playing the market.” Unfortunately for him, somewhere along the line he crossed over the line between *investing* in stocks and *gambling* with money his family needed to secure its financial independence.

Cal’s family always knew that stock ownership involved some risk. Perhaps Clarence Sr. was careful at first with his choice of stocks. Then, as those choices paid well and he was able to make bigger profits, he was swept along by the tide of his increasing fortune, and he began to take bigger risks. When the market dropped so suddenly in October 1987, some of the riskier companies lost so much of their value that he was forced to sell many of his holdings at a loss.



It is hard to define the line between investing safely and gambling with money needed for essentials; this line is defined differently in every family. You should be aware that carefully conducted studies have shown that very few people successfully “play the market,” that is, very few people can *consistently* buy stocks for a few weeks or months and then sell the stocks at a profit.

On the other hand, if you carefully choose a group of stocks for the fundamental value of the underlying companies or the ability of those companies to sustain long-term growth, you may, *if you hold such stocks over several years*, be able to build up your family’s wealth, especially if the overall economy is healthy. In the past, stocks in well-managed companies have also been a good buffer against inflation when held for many decades. Moreover, stocks, unlike some other forms of investment, are easy to liquidate if you need cash.

Clarence Sr. was lucky that he could still afford to buy a house and car. He would say that you should consider all of the following points before you invest in stocks.

1. Be sure you can afford to lose what you risk.
2. Determine specific long-term and short-term investment goals.
3. Ask yourself if you have the emotional temperament suited to handling the ups and downs of investing.
4. Plan to spend time as well as money on the companies you invest in.
5. Choose an experienced, reputable broker to give you guidance and advice.
6. Do not expect too much too soon.
7. After you have set your goals and objectives, stick to them.
8. Be aware that you are buying part of a particular company, not a lottery ticket on the next stock market move.
9. Have an overall family investment plan to protect you from falling into hit-or-miss investing.

THE PROCESS OF BUYING AND SELLING

If Maria decides that she can follow the above guidelines, then she may open an account with a **broker**, that is, a salesperson who specializes in buying and selling stocks and bonds. When Maria buys or sells a stock, she must pay the broker a **commission**. Commission rates vary according to the brokerage house and the size of the trade.

If her brokerage firm is a **full-service firm**, then it will issue reports on individual companies, and its brokers will offer opinions on individual stocks. If she has an account with such a firm, she can get its reports and study them. However, the quality of advice in these reports and from individual brokers will vary from very good to poor. To find a competent broker, she should do what she would do to find a competent physician or lawyer: obtain some names from a person whose advice she trusts. In this case, Maria decides to contact an older friend who has years of investing experience.

If Maria had preferred to do her own research, she could have chosen to open an account with a **discount broker**, who charges much lower commissions than a full-service broker but provides no investment advice at all.

Many investors purchase a hundred shares of a particular stock, which is called a **round lot**. A trade of fewer than 100 shares is called an **odd lot**. Because odd lots can be inconvenient to trade, Maria may have to pay a higher broker commission for an odd lot than for a round lot.

Stocks are traded on national and regional stock exchanges. The largest of these is the *New York Stock Exchange*, where over 84 percent of all listed securities are bought and sold. The *American Stock Exchange* is the other national exchange in the United States. Many stocks trade not on an exchange but rather in the **over-the-counter market**, a national network of dealers and brokers who trade among themselves by telephone, telegraph, or teletype.

Stocks are bought and sold on a security exchange by the auction method. A stock may be offered for sale at a certain price, or someone may bid for the same stock at a lower price. A sale is made when either the buyer or the seller meets the other's price. Maria can instruct her broker to purchase or sell shares of stock for her with a limit on the price that she will accept.

Ask Yourself

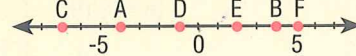
1. How does investing in stocks differ from "playing the market"?
2. What are some guidelines that you should follow before you decide to invest in stocks? Which guideline do you think is the most important for you?
3. Why should investors be careful about following the advice of a stockbroker?

ALGEBRA REVIEW

One way to think about **absolute value** is to look at the number line. The distance from zero to any point on the number line is positive.

Find each distance.

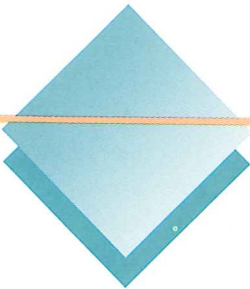
Examples: From 0 to A is 4
From 0 to B is 4



1. From 0 to C
2. From 0 to D
3. From 0 to E
4. From 0 to F

Find the absolute value of each change in price.

5. Old price: \$100
New price: \$85
6. Old price: \$85
New price: \$100
7. Old price: $65x$
New price: $95x$
8. Old price: $5a$
New price: $1.5a$



SHARPEN YOUR SKILLS

SKILL 1

Commission rates are charged on a percent-of-sale basis. In other words, in addition to the cost of the stocks or bonds, you must pay a percentage of the cost for commission. To determine the cost of a commission, you multiply the number of shares, the price of one share, and the commission rate.

Commission Cost Formula

$$c = npr \quad \text{where } c = \text{cost of commission}$$
$$n = \text{number of shares}$$
$$p = \text{price of one share}$$
$$r = \text{commission rate}$$

EXAMPLE 1 Maria would like to buy 250 shares of International Enterprises, Inc. at $17\frac{3}{4}$ per share. She wants to compare the commissions charged by Osgood and Company, a full-service broker with a commission rate of 2%, and Willcox and Company, a discount broker with a commission rate of 1%.

QUESTION How much commission will each broker charge, and what will the total cost be?

SOLUTION

Osgood and Company

$$c = npr$$
$$c = 250 \cdot 17.75 \cdot 0.02$$
$$c = 88.75$$

Willcox and Company

$$c = npr$$
$$c = 250 \cdot 17.75 \cdot 0.01$$
$$c = 44.375$$

The commission is \$88.75.

The commission is \$44.38.

The purchase price of the stock is $250 \cdot 17.75 = 4437.50$. Add the commission to \$4437.50 to find the total cost.

$$88.75 + 4437.50 = 4526.25$$

$$44.38 + 4437.50 = 4481.88$$

The total cost at Osgood is \$4526.25, and the total cost at Willcox is \$4481.88. Maria will pay $88.75 - 44.38 = \$44.37$ more at Osgood.

If you decide to sell a stock, you will pay a brokerage commission, just as you did when you bought the stock. However, the selling commission and buying commission will normally not be equal since the selling price usually differs from the purchase price.

SKILL 2

When you sell stock that you have owned for a period of time, your stock may have increased in value. This increase is called a *capital gain*. Usually, you will have to pay income taxes on the capital gain on a stock that you have sold. If the value of your stock decreases and you sell, you will have a loss.

EXAMPLE 2 Maria would like to know what the capital gain would be on the 250 shares of International Enterprises. Assume that she purchased the stock from the full-service broker.

QUESTION What would be Maria's capital gain if the market price of the stock increases to $72\frac{1}{4}$ over the next 10 years?

SOLUTION

Multiply the new price of one share by the number of shares.

$$72.25 \cdot 250 = 18,062.50$$

The capital gain is found by subtracting the total purchase price from the total value of the stock after 10 years.

$$18,062.50 - 4526.25 = 13,536.25$$

Maria's capital gain after 10 years is \$13,536.25. If she does not sell, her capital gain may increase or decrease in value. If she does decide to sell, then the amount that will be subject to tax is the capital gain reduced by both her buying commission and her selling commission.

SKILL 3

The rate of increase or decrease is the *change in price* divided by the original price. A formula for the rate of increase or decrease involves *absolute value*. To find the percent of increase or decrease, divide the rate by 100.

Rate-of-Change Formula

$$r = \frac{|P_n - P_o|}{P_o}$$

where r = rate of increase or decrease

P_o = original price

P_n = new price

EXAMPLE 3 Maria would like to know the percent of decrease or increase when the price of a share of stock varies.

- QUESTIONS**
1. If the market price of a share of stock drops from \$45 to \$40, what is the percent of decrease?
 2. If the market price of a share of stock increases from \$45 to \$60, what is the percent of increase?

SOLUTIONS

$$\begin{aligned} 1. \quad r &= \frac{|P_n - P_o|}{P_o} && \text{Use the rate-of-change formula.} \\ &= \frac{|40 - 45|}{45} && P_n = 40, P_o = 45 \\ &= \frac{5}{45} && |40 - 45| = |-5| = 5 \\ &= 0.11 \end{aligned}$$

The percent of decrease is 11%.

$$\begin{aligned} 2. \quad r &= \frac{|P_n - P_o|}{P_o} && \text{Use the rate-of-change formula.} \\ &= \frac{|60 - 45|}{45} && P_n = 60, P_o = 45 \\ &= \frac{15}{45} && |60 - 45| = |15| = 15 \\ &= 0.33 \end{aligned}$$

The percent of increase is 33%.

SKILL 4

Maria has learned that commission rates can vary widely on the purchase of stocks or mutual funds. Some brokers charge as little as 1%, while mutual funds have commissions that vary from 0 to over 8%.



EXAMPLE 4 Maria decided to compare how various commission rates affect an investment of \$1000.

QUESTION How does the commission rate affect the purchase price of a stock or mutual fund?

SOLUTION

She wrote an equation for the relationship between the total cost T of a stock or mutual fund purchase and the commission rate r :

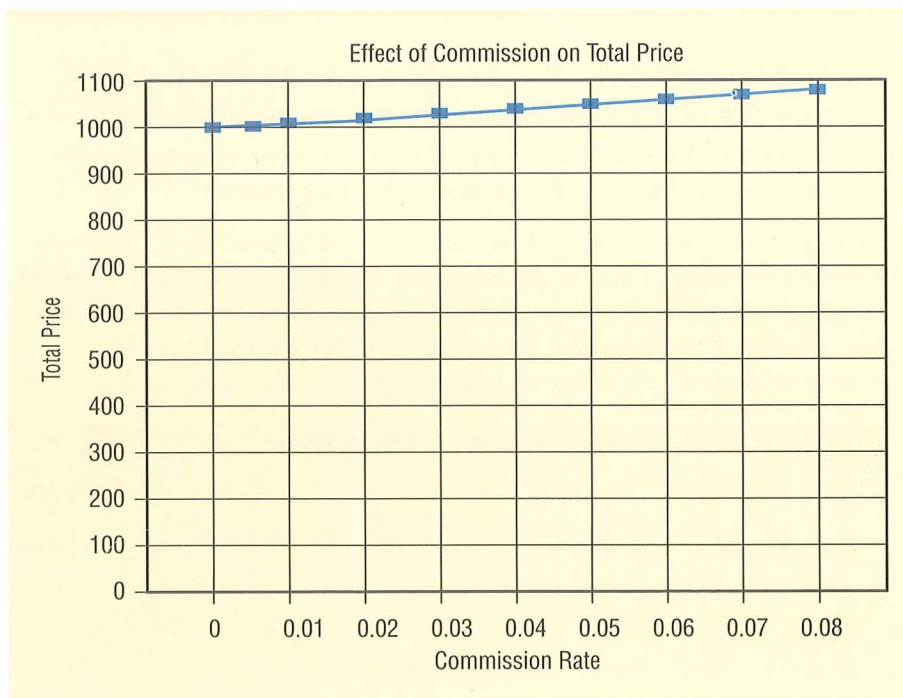
$$\begin{aligned} \text{Total price} &= \text{price} + \text{commission} \\ T &= 1000 + 1000r \end{aligned}$$

Next, she used a spreadsheet program to calculate the total price T for commission rates r ranging between 0 (no commission) and 8%.



| | | | | | | | | | | |
|-----|------|-------|------|------|------|------|------|------|------|------|
| r | 0 | 0.005 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 |
| T | 1000 | 1005 | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 |

Using the spreadsheet's graphing program, Maria graphed the values with r on the horizontal axis and T on the vertical axis. The graph showed clearly that the commission rate and total purchase price had a *linear* relationship. Whenever the commission rate increases by 1 percentage point, her cost also increases, by \$10.



TRY YOUR SKILLS

Find the cost of these shares of stock before commission.

1. 300 shares at $21\frac{1}{8}$
2. 225 shares at $63\frac{1}{4}$
3. 45 shares at $32\frac{1}{2}$
4. 40 shares at $16\frac{5}{8}$

5.–7. For Exercises 1–3, find the commission and the total cost if the commission rate is 1.5%.

Suppose that the 40 shares of Exercise 4 are held for 5 years. Find the capital gain or capital loss in each case. Ignore the effect of commissions.

8. Market price is $\$42\frac{7}{8}$
9. Market price is $\$14$

10.–11. Find the percent gain or loss in market price for the stocks of Exercises 8 and 9.

Use a spreadsheet graphing program to show how the total cost of a mutual fund purchase is related to the commission rate for commission rates of 0 to 8% when the amount invested is as given.

12. \$500
13. \$2000

EXERCISE YOUR SKILLS

1. How does temperament affect the way a person handles investments?
2. How should an investor determine how much money to invest in stocks?
3. Why might it be wiser for some people to invest in a completely safe security, such as U.S. savings bonds, rather than stocks?

Find the purchase price of these shares of stock at the prices shown. Ignore the effect of commissions. Find the capital gain or capital loss at the current market value one year later by subtracting the purchase price from the current market value. Note that if the difference is a negative number, then there is a loss. Calculate the percent of increase or decrease. Put parentheses around a decrease.

KEY TERMS

broker
commission
discount broker
full-service broker
odd lot
over-the-counter
market
round lot

| | Company | Number of Shares | Original Purchase | | Current Market | | Gain or Loss | Percent of Change |
|-----|---------|------------------|-------------------|-------------|-----------------|-------------|--------------|-------------------|
| | | | Price/Share | Total Price | Price/Share | Total Price | | |
| 4. | AP&P | 306 | $41\frac{7}{8}$ | \$12,813.75 | $43\frac{3}{8}$ | | \$459 gain | 3.6% |
| 5. | Zola | 215 | $10\frac{1}{4}$ | | $16\frac{1}{2}$ | | | |
| 6. | ABM | 400 | $42\frac{1}{2}$ | | $65\frac{7}{8}$ | | | |
| 7. | Lands | 6000 | 20 | | $18\frac{1}{4}$ | | | |
| 8. | Dr. Pop | 150 | $29\frac{3}{8}$ | | $26\frac{3}{8}$ | | | |
| 9. | Doledo | 310 | $9\frac{7}{8}$ | | $17\frac{1}{4}$ | | | |
| 10. | Binbury | 55 | $65\frac{5}{8}$ | | $74\frac{1}{4}$ | | | |

MIXED REVIEW

Find the amount that each company must pay each year for the indicated fringe benefits.

- Salary: \$38,000
7.65% for FICA taxes
4% of gross pay for retirement
\$1800 per year for training
- Salary: \$25,000
7.65% for FICA taxes
\$75 per month for health insurance
\$80 per month for life insurance

Find the new balance B for the indicated investments. Use the compound interest formula $B = P(1 + r)^n$, where P is the initial principal, r is the interest rate for the period, and n is the number of periods.

- Starting principal: \$1000; annual compounding at 8% for 5 years
- Starting principal: \$12,500; semiannual compounding at 7% per year for 12 years
- Use the monthly payment formula $M = \frac{Pr(1 + r)^n}{(1 + r)^n - 1}$ to find the monthly payment for a car loan of \$8000 at 9% a year for 4 years. In the formula, r represents the monthly interest rate and n represents the total number of payments.
- How long will it take to pay off a credit card balance of \$2500 with monthly payments of \$150 if the APR is 9%? Express your answer as a whole number of months.

The following chart shows the payments in a credit card account during the month of April. The monthly interest rate is 1.5%.

| Dates | Payment | Balance at End of Day | Number of Days | Sum of Daily Balances |
|----------|---------|-----------------------|----------------|-----------------------|
| 4/1–4/29 | 0.00 | \$406.00 | 29 | \$11,774.00 |
| 4/30 | \$95.00 | 311.00 | 1 | 311.00 |
| | | Total | 30 | \$12,085.00 |

- Determine the average daily balance.
- Determine the finance charge on April 30.
- Determine the ending balance for April.
- Your balance from 1/1 to 1/15 was \$450. Then you made a payment of \$100 on 1/16. You made no further charges or payments for the remainder of the month. Determine your average daily balance for January. How much did you pay in interest if your card carries a monthly finance charge of 1.75%?