



# Computing Interest on Certificates of Deposit

A **certificate of deposit** (CD) is a type of investment that earns a higher interest rate than a regular savings account. The only drawback is that you are penalized for early withdrawal. Interest is compounded daily, monthly, or quarterly, depending on your particular financial institution.

### Example

**Compute the interest.**

Morgana LeFey invests \$10,000 into a 4-year certificate of deposit that earns an interest rate of 5.75 percent compounded quarterly. How much interest will she earn at the end of the 4 years?

- Find the amount using the Amount of \$1.00 Invested table on page 180.

$$\text{Amount} = \text{Original Principal} \times \text{Amount per \$1.00}$$

$$\$10,000 \times 1.256541 = \$12,565.41$$

- Find the interest.

$$\text{Interest Earned} = \text{Amount} - \text{Original Principal}$$

$$\$12,565.41 - \$10,000 = \$2,565.41 \text{ interest}$$

### Practice

Find the amount and the interest earned. Refer to the Amount of \$1.00 Invested table on page 180.

	Annual Rate	Interest Period	Original Principal	Amount	Interest Earned
1.	5.50%	4 years daily	\$ 6,000	a.	b.
2.	4.25%	4 years monthly	9,500	a.	b.
3.	3.75%	1 year quarterly	12,000	a.	b.
4.	5.00%	1 year monthly	25,750	a.	b.

- Marybeth Evanston can invest \$7,500 in a 1-year CD earning 5 percent interest compounded daily or a 1-year CD earning 5.25 percent interest compounded quarterly. Which rate earns her more interest? How much more?
- Felix Capistrano invests \$25,000 in a 4-year CD earning 6 percent interest compounded quarterly. What is the amount at maturity? How much interest does he earn at the end of the 4 years?
- Standardized Test Practice** Robert and Katie Masterson have the option of investing their \$20,000 savings in a 4-year CD earning 5.00 percent interest compounded daily, 5.25 percent interest compounded monthly, or 5.50 percent interest compounded quarterly. Which CD earns the most interest?
  - 5% compounded daily
  - 5.25% compounded monthly
  - 5.5% compounded quarterly
  - They all earn the same amount of interest.



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# Determining the Effective Annual Yield

The **annual yield** of a CD is the rate at which your money earns simple interest in 1 year. *Effective annual yield* is influenced by the frequency of compounding. Yield is the rate of return on your investment and is usually expressed as a percentage.

**Example**

Find the effective annual yield to the nearest thousandth percent.

Morgana LeFey invested \$10,000 in a 5-year certificate of deposit that earns an interest rate of 5.75 percent compounded quarterly.

1. Find the amount. (Refer to the Amount of \$1.00 Invested table on page 180.)  
**Amount = Original Principal × Amount per \$1.00 for One Year**  
 $\$10,000 \times 1.058752 = \$10,587.52$
2. Find the interest for 1 year.  
**Interest = Amount – Principal**  
 $\$10,587.52 - \$10,000 = \$587.52$
3. Find the effective annual yield.  
**Effective Annual Yield = Interest for One Year ÷ Principal**  
 $\$587.52 \div \$10,000 = 5.875\%$  effective annual yield

**Practice**

Find the amount, the interest earned, and the effective annual yield. (Refer to the Amount of \$1.00 Invested table on page 180.)

	Annual Rate	Interest Period	Original Principal	Amount	Interest Earned	Effective Annual Yield
1.	5.50%	1 year monthly	\$ 5,000	a.	b.	c.
2.	4.75%	1 year daily	9,700	a.	b.	c.
3.	4.50%	1 year quarterly	11,250	a.	b.	c.
4.	5.25%	1 year monthly	14,875	a.	b.	c.

5. Al Holman can invest \$15,000 at 5.25 percent interest in a 4-year CD compounded monthly or quarterly. What is the effective annual yield of each?
6. Marybeth Evanston can invest \$7,500 in a 1-year CD earning 3 percent interest compounded daily or a 1-year CD earning 3.25 percent interest compounded quarterly. Which earns a higher effective annual yield?
7. Felix Capistrano invests \$25,000 in a 4-year CD earning 5.5 percent interest compounded quarterly. What is the effective annual yield?
8. **Standardized Test Practice** Robert and Katie Masterson have the option of investing their \$20,000 savings in a 4-year CD earning 5.00 percent interest compounded daily, 5.25 percent interest compounded monthly, or 5.50 percent interest compounded quarterly. Based on the annual effective yield, which is the best investment?
  - A. 5% compounded daily
  - B. 5.25% compounded monthly
  - C. 5.5% compounded quarterly
  - D. They all earn the same annual effective yield.



# Determining the Total Cost of a Stock Investment

Another way of investing your money is to buy **stocks**. Purchasing a share of stock makes you a part owner in the corporation that issues you the stock. A **stock certificate** represents proof of ownership. The total cost of your stock depends on the cost per share, the number of shares you purchase, and the stockbroker's commission.

### Example

**Find the total cost of stock.**

Morgana LeFey purchased 50 shares of stock at \$218.00 per share. If her broker charged her a 1 percent commission on the cost of the stock, what is the total amount she paid for the stock?

1. Find the cost of the stock.  
**Cost of Stock = Number of Shares × Cost per Share**  
 $50 \times \$218 = \$10,900$
2. Find the broker's commission.  
 Broker's commission =  $\$10,900 \times 1\% = \$109$
3. Find the total cost of the stock.  
**Total Paid = Cost of Stock + Commission**  
 $\$10,900 + \$109 = \$11,009$  total cost

### Practice

**Find the cost of the stock and the total amount paid.**

	Number of Shares	Cost per Share	Cost of Stock	Commission	Total Paid
1.	250	\$ 57.00	a.	\$100.00	b.
2.	100	215.50	a.	\$250.00	b.
3.	375	41.75	a.	1% of total cost	b.
4.	425	132.95	a.	\$0.18 per share	b.

5. Al Holman purchased 75 shares of stock at \$37.75 per share. If his broker charged a 1.5 percent commission on the cost of the stock, what was the total paid?
6. Marybeth Evanston purchased 2,000 shares of stock at \$3.15 per share. The broker's commission was \$29.95 for less than 1,000 shares, or \$0.03 per share for 1,000 or more. What was the total amount Evanston paid for her stock?
7. Felix Capistrano bought 50 shares of shipping stock at \$25 per share and 30 shares of airline stock at \$45 per share. The broker's fee is \$15 per transaction. What is the total combined amount Capistrano paid for his stock?
8. **Standardized Test Practice** Robert and Katie Masterson bought 99 shares of oil stock at a price of \$55 per share and 150 shares of stock in a steel company at \$24 per share. The broker's commission is \$25 for transactions under 100 shares and \$0.20 per share for transactions over 100 shares. What is the total combined amount that the Mastersons paid for both stock transactions?  
 A. \$9,100.00    B. \$9,094.80    C. \$9,095.00    D. \$9,045.00



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# Computing the Dividend and Yield of a Stock Investment

A stock **dividend** is money you receive as a shareholder of the company. The yield, expressed as a percentage of the price of the stock, is your annual return for holding a stock.

**Example**

Find the total annual dividend and the annual yield to the nearest thousandth percent.

Morgana LeFey purchased 50 shares of company stock at \$147.00 per share. The company paid annual dividends of \$2.97 per share.

- Find the total annual dividend.

$$\text{Total Annual Dividend} = \text{Annual Dividend per Share} \times \text{Number of Shares}$$

$$\$2.97 \times 50 = \$148.50 \text{ total annual dividend}$$

- Find the annual yield.

$$\text{Yield} = \text{Annual Dividend per Share} \div \text{Cost per Share}$$

$$\$2.97 \div \$147.00 = 2.020\% \text{ yield}$$

**Practice**

Find the annual yield.

	<b>Annual Dividend per Share</b>	<b>Cost per Share</b>	<b>Annual Yield</b>
1.	\$0.96	\$ 57.72	
2.	3.07	191.54	
3.	0.75	37.85	
4.	1.39	122.63	

- Al Holman purchased 75 shares of company stock at \$37.75 per share. Last year the company paid annual dividends of \$1.02 per share. What were Holman's annual dividends? What was his annual yield?
- Marybeth Evanston purchased 2,000 shares of airline stock at \$3.15 per share. The company recently paid annual dividends of \$0.09 per share. What are Evanston's annual dividends? What is her annual yield?
- Felix Capistrano bought 30 shares of oil stock at \$45 per share. He recently read that the average selling price of his stock was \$51.72. The company paid annual dividends of \$1.15 per share last year. What is his annual yield? What would his annual yield be if he had bought the stock at its current average selling price?
- Standardized Test Practice** Robert Masterson bought 99 shares of stock at a price of \$55 per share and 150 shares at \$52 per share. The annual dividend per share was \$1.27. What is Masterson's *average* annual yield?  
 A. 2.309%    B. 2.442%    C. 2.374%    D. 2.388%

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# Calculating the Profit or Loss from a Stock Sale

Selling your stock can result in either a **profit** or a **loss**. If the amount you receive on the sale minus the sales commission is greater than the total amount you paid for the stock, then you make a profit. If it is less than the total amount you paid for the stock, then you suffer a loss.

**Net Sale = Amount of Sale – Commission**

**Profit = Net Sale – Total Paid**

**Loss = Total Paid – Net Sale**

**Example**

**Find the profit or loss.**

Morgana LeFey paid a total of \$8,600 for 50 shares of stock. She sold the stock for \$170 per share and paid her broker a sales commission of \$15. What is the profit or loss from the sale?

1. Find the net sale.  
 $(\$170 \times 50) - \$15 = \$8,485$  net sale
2. Is the net sale greater than or less than the amount paid?  
 $\$8,485$  is less than  $\$8,600$
3. Find the net loss.  
 $\$8,600 - \$8,485 = \$115$  loss

**Practice**

**Find the net sale and the profit or loss.**

	<b>Total Paid</b>	<b>Selling Price per Share</b>	<b>Number of Shares</b>	<b>Commission</b>	<b>Net Sale</b>	<b>Profit or Loss</b>
1.	\$ 2,850	\$ 60.00	50	\$60.00	a.	b.
2.	13,125	172.00	75	\$75.00	a.	b.
3.	5,365	33.50	145	\$0.15 per share	a.	b.

4. Al Holman purchased 75 shares of stock and paid a total of \$2,625. He sold the stock at a price of \$36.82 per share and paid a \$19 broker's commission. What was the net amount of the sale? What was Holman's profit or loss?
5. Marybeth Evanston purchased 2,000 shares of stock at \$3.15 per share. She recently sold the stock for \$3.09 per share. Each transaction carried a broker's fee of \$9.95. What was Evanston's net amount of the sale? What was her profit or loss?
6. **Standardized Test Practice** Robert Masterson bought 150 shares of stock at \$52 per share. He held the stock for 2 years and then sold it for \$53.25 per share. His online brokerage fee is \$8.95 plus \$0.10 per share. What is Masterson's profit or loss?  
**A.** \$139.60 profit    **B.** \$139.60 loss    **C.** \$187.50 profit    **D.** \$187.50 loss



12-6

# Computing the Annual Interest and Annual Yield of a Bond Investment

When you buy **bonds** you are lending your money to a corporation or the government for a specified period of time. A bond is a written pledge that you'll be repaid your money plus interest at its maturity date (anywhere from 10 to 30 years). How long you keep a bond and how often it pays interest determines the value of your bond.

**Example**

Find the annual yield rounded to the nearest hundredth percent.

Morgana LeFey purchased a \$7,500 bond at the quoted price of  $91\frac{1}{2}$ . The bond paid an interest rate of 6.5 percent.

1. Find the bond cost.  
**Bond Cost = Face Value × Percent**  
 $\$7,500 \times 91.5\% = \$6,862.50$  bond cost
2. Find the annual interest.  
**Annual Interest = Face Value × Interest Rate**  
 $\$7,500 \times 6.5\% = \$487.50$  annual interest
3. Find the annual yield.  
**Annual Yield = Annual Interest ÷ Bond Cost**  
 $\$487.50 \div \$6,862.50 = 7.10\%$  annual yield

**Practice**

Find the cost of the bond, the annual interest, and the annual yield.

	Face Value of Bond	Quoted Price	Cost of Bond	Interest Rate	Annual Interest	Annual Yield
1.	\$ 4,000	$75\frac{1}{4}$	a.	7.00%	b.	c.
2.	12,000	$92\frac{1}{2}$	a.	7.50%	b.	c.
3.	3,500	102	a.	6.75%	b.	c.
4.	5,775	$101\frac{5}{8}$	a.	8.40%	b.	c.

5. Felix Capistrano purchased 5 bonds at \$1,000 per bond and paid a 1 percent brokerage commission on the principal. The bonds were offered at a quoted price of 101 and earn an annual interest rate of 7.25 percent. What is the total cost of Capistrano's purchase? What total interest will he earn each year?
6. **Standardized Test Practice** Al Holman purchased a \$12,000 city bond at a quoted price of  $79\frac{1}{4}$ . The city board pays annual interest at a rate of 5.8 percent. What is the annual yield on the bond?  
**A.** 7.29%    **B.** 7.32%    **C.** 7.34%    **D.** 7.36%

## 12 Chapter Review

### *Investments—Which Type Is Right for You?*

In this chapter, you learned that there are other ways to invest your money than in a bank savings account. The potential for a higher rate of return on your money is much greater, but there are risks to consider before you invest your money. Which investment is right for you? How much more interest does one investment earn for you annually than another?

1. You can invest \$5,000 in a regular savings account that earns 4 percent interest compounded quarterly or in a 1-year CD that earns 6 percent interest compounded quarterly. Based on 1 year of interest, which is the better investment?
2. You can invest \$5,000 in a 1-year CD or a 4-year CD, both earning an interest rate of 6 percent. Based on interest alone, which is the better investment? How much more interest does it earn you?
3. What is the effective annual yield, rounded to the nearest thousandth percent, of each of the CDs in Problem 2?
4. You can invest in either the 1-year CD or the 4-Year CD in Problem 2, but you know you are going to need your money in 2 years to purchase a new car. There is a large penalty for early withdrawal. Which is the better investment for you?
5. You buy 50 shares of company stock at \$99 per share. There is a \$50 broker's fee. The company pays an annual dividend of \$1.50 per share. What is the annual yield to the nearest thousandth percent?
6. You sell those same 50 shares of stock for \$105 per share. The transaction involves a broker's commission of \$0.03 per share. What is your profit or loss?
7. You invest your \$5,000 in a 10-year bond at the quoted rate of  $96\frac{1}{2}$ . The bond pays an interest rate of 6 percent. What is the annual interest? What is the annual yield, rounded to the nearest hundredth percent?