

Key

3.1 Practice Problems

1. Mitchell has a balance of \$1,200 in his First State Bank checking account. He deposits a \$387.89 paycheck, a \$437.12 dividend check, and a personal check for \$250 into his account. He wants to receive \$400 in cash. How much will he have in his account after the transaction?

$$1200 + 387.89 + 437.12 + 250 - 400$$

\$1875.01

2. New Merrick Bank charges a \$21-per-check overdraft protection fee. On June 5, Lewis had \$989.00 in his account. Over the next few days, the following checks were submitted for payment at his bank: June 6, \$875.15, \$340.50, and \$450.63; June 7, \$330; and June 8, \$560.00.

a. How much will he pay in overdraft protection fees?

989.00
- 875.15

113.85

4 transactions in the negative
so, $21 \times 4 = 84$

b. How much will he owe the bank after June 8?

$$113.85 - 340.50 - 450.63 - 330 - 560 - 84 = 1651.28$$

3. Dean has a checking account at City Center Bank. During the month of April, he made deposits totaling \$2,458.52 and wrote checks totaling \$789.23. He paid a maintenance fee of \$25 and earned \$3.24 in interest. His balance at the end of the month was \$4,492.76. What was the balance at the beginning of April?

April +
2458.52
+ 3.24

2461.76

April -
789.23
+ 25.77

815.00

$$\text{Total inc/de} = 2461.76 - 815$$

$$= 1646.76 - 1647.53$$

$$\text{So, } 4492.76 - 1647.53 = \text{beg balance}$$

~~2845.23~~

\$2845.23

Key

3.2 Practice

1. On the back of Elise's monthly statement, she listed the following outstanding withdrawals: #123, \$76.09; #117, \$400; #130, \$560.25; debit card, \$340.50; and #138, \$83.71. She also determined that a deposit for \$500 and the other for \$328.90 are outstanding. Using these outstanding transactions, what adjustment will have to be made to her statement balance?

$-\$631.65$

2. Pina filled out the following information on the back of her monthly statement:

Ending balance from statement \$1,139.78

Deposits outstanding + \$280.67

Total of checks outstanding - \$656.91

Revised statement balance \$ 763.54

Balance from checkbook \$763.54

Find Pina's revised statement balance. Does her account reconcile?

$\$763.54$ yes it does

3. Arden's checking account charges a \$21 monthly maintenance fee with no per check fee. He wants to switch to a different account with a fee of 18 cents per check and a \$15 monthly maintenance fee. The following information is about his last five monthly statements.

Month	Number of Checks on Statement	Month	Number of Checks on Statement	Month	Number of Checks on Statement
Feb	24	Mar	37	Apr	35
May	33	June	41		

a. What is the mean number of checks Arden wrote per month during the last five months? 34

b. About how much should Arden expect to pay per month for the new checking account? $0.18(34) + 15 = \boxed{\$21.12}$

c. What advice would you give Arden?

Keep the current account

4. Below you will find Mitch West's monthly statement and his check register. Use them to complete parts a – e in his checking account summary. Does his account reconcile?

Checking Account Summary

Ending balance from statement	\$764.22
Ending Balance from Statement	a. 2368.29
Deposits Outstanding	+ b. 300.00
Total of Checks Outstanding	- c. 119.00
Revised statement balance	d. 2549.29
Balance from Checkbook	e. 2549.29

Mitch West 23 Sycamore Lane Benridge, NY 10506	ACCOUNT NUMBER: 456213 A232 STATEMENT PERIOD: 8/15 - 9/15			
STARTING BALANCE → \$2,312.70				
DATE	DESCRIPTION	CHECK NUMBER	TRANSACTION AMOUNT	BALANCE
8/16	W/D	1056	\$ 256.00	
8/20	DEPOSIT		\$ 1,200.80	
8/22	W/D	Debit card	\$ 234.81	
8/22	W/D	1058	\$ 334.90	
8/23	W/D	Debit Card	\$ 34.72	
8/25	W/D	1060	\$ 145.78	
8/26	W/D	1059	\$ 56.00	
8/27	DEPOSIT		\$ 150.00	
9/1	W/D	1061	\$ 230.00	
				ENDING BALANCE → \$2,368.29

✓ Outstanding
 86.50
 + 32.50

 119.00

NUMBER OR CODE	DATE	TRANSACTION DESCRIPTION	PAYMENT AMOUNT	✓ FEE	DEPOSIT AMOUNT	\$ BALANCE
						2,309.70
1056	8/15	Best Offer Inc.	256.00	✓		- 256.00
						2,053.70
1057	8/16	Dept. of Motor Vehicles	86.50			- 86.50
						1,967.20
1058	8/16	AutoWorld	334.90	✓		- 334.90
						1,632.30
	8/18	Car Nation	234.81	✓		- 234.81
						1,397.49
	8/20	Deposit		✓	1,200.80	+ 1,200.80
						2,598.29
1059	8/21	Print Makers	56.00	✓		- 56.00
						2,542.29
1060	8/22	Book Bonanza	145.78	✓		- 145.78
						2,396.51
	8/23	Fast Freddy's Fast Food	34.72	✓		- 34.72
						2,361.79
	8/27	Deposit		✓	150.00	+ 150.00
						2,511.79
1061	8/30	Lincoln Savings Bank	230.00	✓		- 230.00
						2,281.79
1062	9/1	VOID				
1063	9/1	Pasta Pete's	32.50			- 32.50
						2,249.29
	9/2	Deposit			300.00	+ 300.00
						2,549.29

Key

3.3 Practice

1. Gary deposits \$3,700 in an account that pays 2.15% simple interest. He keeps the money in the account for three years, but doesn't make any deposits or withdrawals. How much interest will he receive after the three years?

$$I = 3700 \cdot 0.0215 \cdot 3$$
$$= \$238.65$$

2. How much principal would you have to deposit to earn \$700 simple interest in 1.5 years at a rate of 4%?

$$700 = P \cdot 0.04 \cdot 1.5$$
$$= \$11,666.67$$

3. Jesse estimates that it will cost \$300,000 to send his newborn son to a private college in 18 years. He currently has \$65,000 to deposit in an account. What simple interest rate would he need so that \$65,000 grows into \$300,000 in 18 years? **Round to the nearest percent.**

$$\begin{array}{r} 300,000 \\ - 65,000 \\ \hline \$235,000 = I \end{array}$$

$$235,000 = 65,000 \cdot r \cdot 18$$
$$235,000 = 1,170,000r$$

$$20.1\% = r$$

$$I = prt$$

20%

4. Dillon has a bank account that pays 3.2% simple interest. His balance is \$1,766. How long will it take for the amount in the account to grow to \$2,000? **Round to the nearest year.**

$$\begin{array}{r} 2000 \\ - 1766 \\ \hline 234 = I \end{array}$$

$$234 = 1766 \cdot 0.032 \cdot t$$

~4 years

$$I = prt$$

5. Colin deposited \$1,230 in an account that pays 3.19% simple interest for three years.

a. What will the interest be for the three years?

$$I = 1230 \cdot 0.0319 \cdot 3$$
$$= 117.71$$

b. What will be the new balance after three years?

$$1230 + 117.71$$
$$= 1347.71$$

c. How much interest did the account earn the first year, to the nearest cent?

$$I = 1230 \cdot 0.0319 \cdot 1$$
$$= 39.24$$

d. How much interest did the account earn the second year, to the nearest cent?

$$= 39.24$$

e. How much interest did the account earn the third year, to the nearest cent?

$$= 39.24$$

Key

3.5 Practice

1. Jeff deposits \$2,300 at 3.13% interest compounded weekly. What will be his ending balance after one year?

$$2300 \left(1 + \frac{.0313}{52}\right)^{52} = \boxed{\$2373.11}$$

2. Nancy has \$4,111 in an account that pays 3.07% interest compounded monthly. What is her ending balance after two years?

$$4111 \left(1 + \frac{.0307}{12}\right)^{24} = \boxed{\$4370.98}$$

3. Mr. Weinstein has a savings account with a balance of \$19,211.34. It pays 4% interest compounded daily. What is his ending balance after three years, if no other deposits or withdrawals are made? How much interest does he earn over the three years?

$$19,211.34 \left(1 + \frac{.04}{365}\right)^{365 \times 3} = \boxed{\$21,660.58}$$

$$\begin{array}{r} \boxed{\$21,660.58} \\ - 19,211.34 \\ \hline \boxed{\$2449.24} \end{array}$$

4. Ms. Santoro is opening a one-year CD for \$16,000. The interest is compounded daily. She is told by the bank representative that the annual percentage rate (APR) is 4.8%. What is the annual percentage yield (APY) for this account?

$$APY = \left(1 + \frac{.048}{365}\right)^{365} - 1 = \boxed{4.92\%}$$

5. Compare the simple interest for one year on a principal of 1 million dollars at an interest rate of 6.3% to compounding every second for the same principal and interest rate.

a. How many seconds are in an hour? $60 \cdot 60 = \boxed{3600}$

b. How many seconds are in a day? $3600 \cdot 24 = \boxed{86,400}$

c. How many seconds are in a year? $86,400 \cdot 365 = \boxed{31,536,000}$

d. How much interest does \$1,000,000 earn in one year at 6.3% interest, compounded every second?

$$1,000,000 \left(1 + \frac{.063}{31,536,000}\right)^{31,536,000} = 1,065,026.27 - 1,000,000 = \boxed{\$65,026.27}$$

e. How much does the same \$1,000,000 earn at 6.3% in one year, under simple interest?

$$I = 1,000,000 \times 0.063 \times 1 = \boxed{\$63,000}$$

f. How much more interest did the compounded account earn when compared to the simple-interest account?

$$\boxed{\$2026.27}$$

Key

3.6 Practice

1. Eric deposits \$4,700 at 5.03% interest, compounded continuously for five years.

a. What is his ending balance?

$$4700e^{.0503(5)} = \boxed{\$6043.98}$$

b. How much interest did the account earn?

$$6043.98 - 4700 = \boxed{\$1343.98}$$

2. Find the interest for each compounding period on \$50,000 for 2.5 years at a rate of 4.3%.

a. annually $n=1$

$$\$5549.58$$

b. semiannually $n=2$

$$\$5611.15$$

c. quarterly $n=4$

$$\$5642.61$$

d. monthly $n=12$

$$\$5663.85$$

e. daily $n=365$

$$\$5674.19$$

f. hourly $n=8760$

$$\$5674.53$$

g. continuously

$$\boxed{\$5674.54}$$

3. A private university has an endowment fund that currently has 49 million dollars in it. If it is invested in a one-year CD that pays 5.12% interest compounded continuously, how much interest will it earn?

$$49,000,000e^{.0512(1)} - 49,000,000 = \boxed{\$2,574,135.57}$$

4. Find the interest earned on a \$14,000 balance for nine months at 3.75% interest compounded continuously.

$$14,000e^{.0375\left(\frac{9}{12}\right)} - 14,000 = \boxed{\$399.34}$$

Key

3.7 Practice

1. On December 31, Juan Carlos made a \$7,000 deposit in an account that pays 2.975% interest compounded semi-annually. How much will be in that account at the end of two years.

$$\$7425.89$$

2. Liam was born on October 1, 2009. His grandparents put \$20,000 into an account that yielded 3% interest compounded quarterly. When Liam turns 18, his grandparents will give him the money for a college education. How much will Liam get on his 18th birthday?

$$\$34,251.05$$

3. Colleen is 15 years from retiring. She opens an account at the Savings Bank. She plans to deposit \$10,000 each year into the account, which pays 2.7% interest, compounded annually.

a. How much will be in the account in 15 years?

$$\$181,952.23$$

b. How much interest would be earned?

$$\$31,752.33$$

4. Anton opened an account at Bradley Bank by depositing \$1,250. The account pays 2.325% interest compounded monthly. He deposits \$1,250 every month for the next two years.

a. How much will he have in the account at the end of the two-year period?

$$\$30,678.03$$

b. Write the future value function. Let x represent each of the monthly interest periods.

$$\frac{1250 \left(1 + \frac{0.02325}{12} \right)^x - 1}{\frac{0.02325}{12}}$$

5. Sylvia wants to go on a cruise around the world in 5 years. If she puts \$50 into an account each week that pays 2.25% interest compounded weekly, how much will she have at the end of the five-year period?

$$\$13,756.31$$

6. Marina invests \$200 every quarter into an account that pays 1.5% annual interest rate compounded quarterly. Adriana invests \$180 in an account that pays 3% annual interest rate compounded quarterly.

- a. Determine the amount in Marina's account after 10 years.

\$8613.78

- b. Determine the amount in Adriana's account after 10 years.

\$8360.37

- c. Who had more money in the account after 10 years?

Marina

Key

3.8 Practice

1. Uncle Al wants to open an account for his nieces and nephews that he hopes will have \$100,000 in it after 25 years. How much should he deposit now into an account that yields 1.75% interest compounded monthly so he can be assured of meeting that goal amount?

\$ 64,585.43

2. Althea will need \$30,000 for her nursing school tuition in 18 months. She has a bank account that pays 2.45% interest compounded monthly. How much does she have to put in each month to have enough money for the tuition?

\$ 1637.93

3.. Art opened an account online that pays 2.8% interest compounded monthly. He has a goal of saving \$20,000 by the end of four years. How much will he need to deposit each month?

\$ 399.25

4. Anthony wants to repay the loan his parents gave him in three years. How much does he need to deposit into an account semi-annually that pays 3.25% interest twice a year in order to have \$35,000 to repay the loan?

\$ 5600.81