1. a) \( I = Prt \)
   \[ I = (1000.00)(0.025)(1) \]
   \[ I = 25.00 \]

b) \( I = Prt \)
   \[ I = (1000.00)(0.05)(1) \]
   \[ I = 50.00 \]

c) \( I = Prt \)
   \[ I = (1000.00)(0.025)(2) \]
   \[ I = 50.00 \]

d) \( I = Prt \)
   \[ I = (2000.00)(0.025)(1) \]
   \[ I = 50.00 \]

e) When the principal and the term stay the same but the rate doubles—for example, from question a) to question b) above—the amount of interest earned doubles.

f) When the principal and the rate stay the same but the term doubles—for example, from question a) to question c) above—the amount of interest earned doubles.

2. \( I = Prt \)
   \[ I = (600.00)(0.0375)(5) \]
   \[ I = 112.50 \]

   \[ A = P + I \]
   \[ A = 600.00 + 112.50 \]
   \[ A = 712.50 \]

3. \( I = Prt \)
   \[ I = (1000.00)(0.0450)(10) \]
   \[ I = 450.00 \]

   \[ A = P + I \]
   \[ A = 1000.00 + 450.00 \]
   \[ A = 1450.00 \]

4. \( A = P \left(1 + \frac{r}{n}\right)^n \)
   \[ A = (5000.00) \left(1 + \frac{0.03}{1}\right)^{3*2} \]
   \[ A = (5000.00)(1.03)^3 \]
   \[ A = 5304.50 \]

5. Option 1: $4000.00 invested at 3.50% per annum, compounded annually, for 3 years
   \[ A = P \left(1 + \frac{r}{n}\right)^n \]
   \[ A = (4000.00) \left(1 + \frac{0.035}{1}\right)^{3*3} \]
   \[ A = (4000.00)(1.035)^3 \]
   \[ A = 4434.87 \]

   Option 2: $4000.00 invested at 3.50% simple interest for 3 years
   \( I = Prt \)
   \[ I = (4000.00)(0.0350)(3) \]
   \[ I = 420.00 \]

   \[ A = P + I \]
   \[ A = 4000.00 + 420.00 \]
   \[ A = 4420.00 \]
difference = Option 1 - Option 2
difference = $4434.87 - $4420.00
difference = $14.87

6. \[ A = P \left(1 + \frac{r}{n}\right)^n \]
\[ A = ($8000.00) \left(1 + \frac{0.025}{1}\right)^{1 \times 5} \]
\[ A = ($8000.00)(1.025)^5 \]
\[ A = $9051.27 \]
\[ l = A - P \]
\[ l = $9051.27 - $8000.00 \]
\[ l = $1051.27 \]

7. \( A = P \left(1 + \frac{r}{n}\right)^n \)
\[ A = ($4000.00) \left(1 + \frac{0.04}{1}\right)^{1 \times 8} \]
\[ A = ($4000.00)(1.04)^8 \]
\[ A = $5474.28 \]

b) \( A = P \left(1 + \frac{r}{n}\right)^n \)
\[ A = ($4000.00) \left(1 + \frac{0.04}{2}\right)^{2 \times 8} \]
\[ A = ($4000.00)(1.02)^{16} \]
\[ A = $5491.14 \]

c) \( A = P \left(1 + \frac{r}{n}\right)^n \)
\[ A = ($4000.00) \left(1 + \frac{0.04}{4}\right)^{4 \times 8} \]
\[ A = ($4000.00)(1.01)^{32} \]
\[ A = $5499.76 \]

d) \( A = P \left(1 + \frac{r}{n}\right)^n \)
\[ A = ($4000.00) \left(1 + \frac{0.04}{12}\right)^{12 \times 8} \]
\[ A = ($4000.00)(1.00333)^{32} \]
\[ A = $5505.58 \]

8. Compounded annually:
\[ A = P \left(1 + \frac{r}{n}\right)^n \]
\[ A = ($10000.00) \left(1 + \frac{0.0375}{1}\right)^{1 \times 1} \]
\[ A = ($10000.00)(1.0375) \]
\[ A = $10375.00 \]

Compounded daily:
\[ A = P \left(1 + \frac{r}{n}\right)^n \]
\[ A = ($10000.00) \left(1 + \frac{0.0375}{365}\right)^{365 \times 1} \]
\[ A = $10382.10 \]

difference = daily - annually
\[ difference = $10382.10 - $10375.00 \]
\[ difference = $7.10 \]

9. The investment is compounded quarterly, so the term of each interest period is one-quarter of a year, or 0.25.

<table>
<thead>
<tr>
<th>Interest period</th>
<th>Investment value at beginning of period</th>
<th>Interest earned ((l = Prt))</th>
<th>Investment value at end of period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$3000.00</td>
<td>$3000.00 \times 0.0325 \times 0.25 = $24.38</td>
<td>$3000.00 + $24.38 = $3024.38</td>
</tr>
<tr>
<td>2</td>
<td>$3024.38</td>
<td>$3024.38 \times 0.0325 \times 0.25 = $24.57</td>
<td>$3024.38 + $24.57 = $3048.95</td>
</tr>
<tr>
<td>3</td>
<td>$3048.95</td>
<td>$3048.95 \times 0.0325 \times 0.25 = $24.77</td>
<td>$3048.95 + $24.77 = $3073.72</td>
</tr>
<tr>
<td>4</td>
<td>$3073.72</td>
<td>$3073.72 \times 0.0325 \times 0.25 = $24.97</td>
<td>$3073.72 + $24.97 = $3098.69</td>
</tr>
<tr>
<td>5</td>
<td>$3098.69</td>
<td>$3098.69 \times 0.0325 \times 0.25 = $25.18</td>
<td>$3098.69 + $25.18 = $3123.87</td>
</tr>
<tr>
<td>6</td>
<td>$3123.87</td>
<td>$3123.87 \times 0.0325 \times 0.25 = $25.38</td>
<td>$3123.87 + $25.38 = $3149.25</td>
</tr>
<tr>
<td>7</td>
<td>$3149.25</td>
<td>$3149.25 \times 0.0325 \times 0.25 = $25.59</td>
<td>$3149.25 + $25.59 = $3174.84</td>
</tr>
<tr>
<td>8</td>
<td>$3174.84</td>
<td>$3174.84 \times 0.0325 \times 0.25 = $25.80</td>
<td>$3174.84 + $25.80 = $3200.64</td>
</tr>
</tbody>
</table>
Students can check their final answer by using the compound interest formula.

\[ A = P \left( 1 + \frac{r}{n} \right)^{nt} \]

\[ A = ($3000.00) \left( 1 + \frac{0.0325}{4} \right)^{4 \times 8} \]

\[ A \approx $3200.64 \]

10. a) Years to double investment = 72 ÷ (interest rate as a percent)
Years to double investment = 72 ÷ 4
Years to double investment = 18
It will take about 18 years for the investment to double in value.

b) Years to double investment = 72 ÷ (interest rate as a percent)
Years to double investment = 72 ÷ 2.45
Years to double investment = 29.4
It will take about 29.4 years for the investment to double in value.

c) Years to double investment = 72 ÷ (interest rate as a percent)
Years to double investment = 72 ÷ 1.95
Years to double investment = 36.9
It will take about 36.9 years for the investment to double in value.

PRACTISE YOUR NEW SKILLS, p. 301

1. a) \( I = Prt \)
\( I = ($400.00)(0.0125)(8) \)
\( I = $40.00 \)
\( A = P + I \)
\( A = $400.00 + $40.00 \)
\( A = $440.00 \)

b) \( I = Prt \)
\( I = ($750.00)(0.0275)(5) \)
\( I = $103.13 \)
\( A = P + I \)
\( A = $750.00 + $103.13 \)
\( A = $853.13 \)

c) \( I = Prt \)
\( I = ($1000.00)(0.0450)(10) \)
\( I = $450.00 \)
\( A = P + I \)
\( A = $1000.00 + $450.00 \)
\( A = $1450.00 \)

d) \( I = Prt \)
\( I = ($1200.00)(0.0395)(9) \)
\( I = $426.60 \)
\( A = P + I \)
\( A = $1200.00 + $426.60 \)
\( A = $1626.60 \)

2. a) \( A = P \left( 1 + \frac{r}{n} \right)^{nt} \)
\( A = ($400.00) \left( 1 + \frac{0.0125}{12} \right)^{12 \times 8} \)
\( A = $442.05 \)

b) \( A = P \left( 1 + \frac{r}{n} \right)^{nt} \)
\( A = ($750.00) \left( 1 + \frac{0.0275}{12} \right)^{12 \times 5} \)
\( A = $860.42 \)

c) \( A = P \left( 1 + \frac{r}{n} \right)^{nt} \)
\( A = ($1000.00) \left( 1 + \frac{0.0450}{12} \right)^{12 \times 10} \)
\( A = $1566.99 \)
\[ A = P \left(1 + \frac{r}{n}\right)^n \]

\[ A = (\$1200.00) \left(1 + \frac{0.0395}{12}\right)^{12 \times 9} \]

\[ A = \$1711.27 \]

3. The investment is compounded semi-annually, so the term for each interest period is 0.5 years.

<table>
<thead>
<tr>
<th>Interest period</th>
<th>Investment value at beginning of period</th>
<th>Interest earned (I = Prt)</th>
<th>Investment value at end of period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$1000.00</td>
<td>$1000.00 x 0.0385 x 0.5 = $19.25</td>
<td>$1000.00 + $19.25 = $1019.25</td>
</tr>
<tr>
<td>2</td>
<td>$1019.25</td>
<td>$1019.25 x 0.0385 x 0.5 = $19.62</td>
<td>$1019.25 + $19.62 = $1038.87</td>
</tr>
<tr>
<td>3</td>
<td>$1038.87</td>
<td>$1038.87 x 0.0385 x 0.5 = $20.38</td>
<td>$1038.87 + $20.38 = $1059.25</td>
</tr>
<tr>
<td>4</td>
<td>$1058.87</td>
<td>$1058.87 x 0.0385 x 0.5 = $20.38</td>
<td>$1058.87 + $20.38 = $1079.25</td>
</tr>
</tbody>
</table>

Students can check their answer using the compound interest formula.

\[ A = P \left(1 + \frac{r}{n}\right)^n \]

\[ A = (\$1000.00) \left(1 + \frac{0.0300}{365}\right)^{3 \times 5} \]

\[ A = \$4376.68 \]

b) \[ A = P \left(1 + \frac{r}{n}\right)^n \]

\[ A = (\$4000.00) \left(1 + \frac{0.0300}{365}\right)^{3 \times 5} \]

\[ A = \$4399.37 \]

5. a) Years to double in value = 72 ÷ (interest rate as a percent)

Years to double in value = 72 ÷ 2.80

Years to double in value ≈ 26

It will take about 26 years for the investment to double in value.

b) \[ A = P \left(1 + \frac{r}{n}\right)^n \]

\[ A = (\$1000.00) \left(1 + \frac{0.0280}{12}\right)^{1 \times 26} \]

\[ A = \$2050.32 \]

6. a) \[ A = P \left(1 + \frac{r}{n}\right)^n \]

\[ A = (\$1000.00) \left(1 + \frac{0.0250}{12}\right)^{1 \times 5} \]

\[ A = \$1133.00 \]

b) Years to double in value = 72 ÷ (interest rate as a percent)

Years to double in value = 72 ÷ 2.5

Years to double in value = 28.8

It will take about 28.8 years for the investment to double in value.

7. Choose a principal, such as $1000.00, and test both investment options.

Option 1: investment at a rate of 1.90% per annum, compounded annually

\[ A = P \left(1 + \frac{r}{n}\right)^n \]

\[ A = (\$1000.00) \left(1 + \frac{0.0190}{1}\right)^{1 \times 5} \]

\[ A = \$1098.68 \]

Option 2: investment at a rate of 1.75% per annum, compounded monthly

\[ A = P \left(1 + \frac{r}{n}\right)^n \]

\[ A = (\$1000.00) \left(1 + \frac{0.0175}{12}\right)^{1 \times 5} \]

\[ A = \$1091.37 \]
The investment at 1.90% per annum compounded annually is a better investment.

8. a) \( A = P \left( 1 + \frac{r}{n} \right)^n \)

\[
A = ($5000.00) \left( 1 + \frac{0.0260}{1} \right)^{1 \times 10}
\]

\[
A = ($5000.00)(1.0260)^{10}
\]

\( A \approx $6463.14 \)

b) \( A = P \left( 1 + \frac{r}{n} \right)^n \)

\[
A = ($5000.00) \left( 1 + \frac{0.0260}{4} \right)^{4 \times 10}
\]

\[
A = ($5000.00)(1 + \frac{0.0260}{4})^{40}
\]

\( A \approx $6479.20 \)

c) \( A = P \left( 1 + \frac{r}{n} \right)^n \)

\[
A = ($5000.00) \left( 1 + \frac{0.0260}{12} \right)^{12 \times 10}
\]

\[
A = ($5000.00)(1 + \frac{0.0260}{12})^{120}
\]

\( A \approx $6482.83 \)

d) \( A = P \left( 1 + \frac{r}{n} \right)^n \)

\[
A = ($5000.00) \left( 1 + \frac{0.0260}{365} \right)^{365 \times 10}
\]

\[
A = ($5000.00)(1 + \frac{0.0260}{365})^{3650}
\]

\( A \approx $6484.59 \)
1. a) \[I = Prt\]
   \[I = (2076.54)(0.1950)(15 + 365)\]
   \[I = 16.64\]

   b) \[I = Prt\]
   \[I = (1007.48)(0.2150)(38 + 365)\]
   \[I = 22.55\]

   c) The term of this investment is 18 months. In the interest calculation, divide 18 months by the number of months per year.
   \[I = Prt\]
   \[I = (2019.64)(0.1850)(18 + 12)\]
   \[I = 560.27\]

2. Calculate the number of days for which Marcia will be charged interest. She will be charged interest for March 10–31 and April 1–2.
   March 10–31 = 22 days (including March 10)
   April 1–2 = 2 days
   Total days = 24

   \[I = Prt\]
   \[I = (568.93)(0.2400)(24 + 365)\]
   \[I = 8.98\]

   \[A = P + I\]
   \[A = 568.93 + 8.98\]
   \[A = 577.91\]

   Marcia will owe $577.91.

3. a) Add up her total purchases.
   \[124.32 + 187.54 + 32.42 + 154.21 + 54.24 + 654.32 = 1207.05\]
   Harley will owe $1207.05.

   b) Calculate 5% of Harley’s unpaid balance.
   \[1207.05 \times 0.05 = 60.35\]
   This is more than $10.00, so her minimum payment will be $60.35.

   c) Calculate her balance after she makes the minimum payment.
   \[1207.05 - 60.35 = 1146.70\]
   Calculate how many days she will be charged interest.
   November 28–30 = 3 days
   December 1–28 = 28 days
   Total = 31 days
   \[I = Prt\]
   \[I = (1146.70)(0.1850)(31 + 365)\]
   \[I = 18.02\]

   \[A = P + I\]
   \[A = 1146.70 + 18.02\]
   \[A = 1164.72\]

4. a) Calculate the number of days.
   December 10–21 = 12 days (including December 10)
b) \[ I = Prt \]
   \[ I = (550.00)(0.2490)(12 + 365) \]
   \[ I = 4.50 \]

\[ A = P + I \]
\[ A = 550.00 + 4.50 \]
\[ A = 554.50 \]

Javier will owe $554.50.

c) Calculate the number of days.

   December 10–31 = 22 days (including December 10)
   January 1–10 = 10 days
   Total = 32 days

\[ I = Prt \]
\[ I = (550.00)(0.2490)(32 + 365) \]
\[ I = 12.01 \]

\[ A = P + I \]
\[ A = 550.00 + 12.01 \]
\[ A = 562.01 \]

5. Calculate her total purchases.

\$28.95 + \$45.39 + \$106.15 = \$180.49

Calculate 5%.

\$180.49 \times 0.05 = \$9.02

This is less than \$10.00, so her minimum payment is \$10.00.

Calculate her unpaid balance.

\$180.49 - \$10.00 = \$170.49

Calculate the number of days she will be charged interest on this balance.

October 30–31 = 2 days
November 1–29 = 29 days
Total = 31 days

Calculate her interest charges on the unpaid balance.

\[ I = Prt \]
\[ I = (170.49)(0.2195)(31 + 365) \]
\[ I = 3.18 \]

Next, calculate how many days she will be charged interest on the November 12 purchase.

November 12–29 = 18 days (including November 12)

Calculate the interest on this purchase.

\[ I = Prt \]
\[ I = (119.65)(0.2195)(18 + 365) \]
\[ I = 1.30 \]

Add the unpaid balance, the new purchase, and the two interest charges.

\$170.49 + \$119.65 + \$3.18 + \$1.30 = \$294.62

6. Calculate the total cost of the payment plan.

25 \times \$75.00 = \$1800.00

Calculate the difference between the cash price and the payment plan price.

\$1800.00 - \$1675.89 = \$124.11

Calculate the interest rate.

\[ I = Prt \]
\[ \frac{124.11}{3351.78} \times 2 \]
\[ 0.0370 \times 2 \]
\[ 0.0740 \]
Multiply by 100 to convert to a percent.

0.0370 \times 100 = 3.70\%

Sol will pay an annual interest rate of 3.70%.

7. Calculate the cost of each option.

Option 1:

10\% \text{ down payment} = 0.10 \times 689.98
10\% \text{ down payment} = 69.00

Monthly payments:

6 \times 115.00 = 690.00

Total cost:

69.00 + 690.00 = 759.00

Option 2:

24 \times 35.00 = 840.00

Option 3:

I = Prt
I = (689.98)(0.2095)(20 \div 365)
I = 7.92

A = P + I
A = 689.98 + 7.92
A = 697.90

Option 3 is the best deal.

8. Calculate the total cost of the payment plan.

60 \times 450.00 = 27000.00

Calculate the difference between the cash price and the payment plan price.

$27000.00 - $24789.00 = $2211.00

Calculate the annual interest rate. The term is 60 months, or 5 years.

I = Prt

$2211.00 = 24789.00 \times r \times 5
$2211.00 = 123945.00r

\frac{2211.00}{123945.00} = r

0.0178 = r

Multiply by 100 to convert to a percent.

0.0178 \times 100 = 1.78\%

Jacquie is paying an annual interest rate of 1.78%.

PRACTICE YOUR NEW SKILLS, p. 313

1. a) I = Prt

I = ($2987.69)(0.2150)(45 + 365)
I = 79.19

b) I = Prt

I = ($1539.99)(0.2095)(6 + 12)
I = 161.31

2. Calculate Simona's minimum payment.

$1630.45 \times 0.05 = 81.52

This is more than $10.00, so her minimum payment is 81.52.

Calculate her balance after she makes the minimum payment.

$1630.45 - 81.52 = 1548.93

Calculate how many days she is charged interest.
June 19–30 = 12 days (including June 19)
July 1–18 = 18 days
Total = 30 days

Calculate the interest due.

\[ I = Prt \]
\[ I = (1548.93)(0.1950)(30 + 365) \]
\[ I = 24.83 \]

\[ A = P + I \]
\[ A = 1548.93 + 24.83 \]
\[ A = 1573.76 \]

3. a) Calculate Vlad’s minimum payment.

\[ 398.51 \times 0.05 = 19.93 \]

This is more than $10.00, so his minimum payment is $19.93.

Calculate his balance after he made the minimum payment.

\[ 398.51 - 19.93 = 378.58 \]

Calculate the number of days he paid interest on this amount (June 13–July 12).

June 13–30 = 18 days (including June 13)
July 1–12 = 12 days
Total = 30 days

Calculate the interest on the unpaid balance.

\[ I = Prt \]
\[ I = (378.58)(0.1850)(30 + 365) \]
\[ I = 5.76 \]

4. a) Calculate the total cost of the living room set on the payment plan.

\[ 435.00 \times 6 = 2610.00 \]

Calculate the difference between the cash price and the payment plan price.

\[ 2610.00 - 2543.90 = 66.10 \]

He will pay $66.10 in interest.

b) Calculate the interest.

\[ I = Prt \]
\[ I = (2543.90)(0.2275)(30 + 365) \]
\[ I = 47.57 \]

Calculate the total cost.
\[ A = P + I \]
\[ A = 2543.90 + 47.57 \]
\[ A = 2591.47 \]

The living room set would cost $2591.47.

5. Calculate the total cost of each option, and the difference between the payment plan cost and the cash price.

Option 1:

\[ \text{Option 1:} \]
\[ $220.00 \times 4 = 880.00 \]
\[ 880.00 - 859.40 = 20.60 \]

Option 2:

\[ \text{Option 2:} \]
\[ 150.00 \times 6 = 900.00 \]
\[ 900.00 - 859.40 = 40.60 \]

Calculate the interest rate of each option.

Option 1:

\[ I = Prt \]
\[ 20.60 = 859.40 \times r \times \left( \frac{4}{12} \right) \]
\[ 20.60 = 286.47r \]
\[ \frac{20.60}{286.47} = r \]
\[ 0.0719 \approx r \]

Multiply by 100 to convert the rate to a percent.

\[ 0.0719 \times 100 = 7.19\% \]

Option 2:

\[ I = Prt \]
\[ 40.60 = 859.40 \times r \times \left( \frac{6}{12} \right) \]
\[ 40.60 = 429.70r \]
\[ \frac{40.60}{429.70} = r \]
\[ 0.0945 \approx r \]

Considering interest rate only, Option 1 is a better buy.
**Personal Loans, Lines of Credit, and Overdrafts**

**BUILD YOUR SKILLS, p. 317**

1. Calculate how much interest Barou paid.

   
   \[
   \text{Interest} = \$275.00 - \$250.00 = \$25.00
   \]

   Use the simple interest formula.

   \[
   I = Prt
   \]

   \[
   \$25.00 = \$250.00 \times r \times (15 \div 365)
   \]

   \[
   \$25.00 = \$10.27r
   \]

   \[
   \frac{\$25.00}{\$10.27} = r
   \]

   \[
   2.43 = r
   \]

   Multiply by 100 to convert the rate to a percent.

   \[
   2.43 \times 100 = 243\%
   \]

   The annual interest rate is 243%.

2. a) Calculate the amount of interest paid.

   \[
   \text{Interest} = \$415.00 - \$400.00 = \$15.00
   \]

   Calculate the annual interest rate.

   \[
   I = Prt
   \]

   \[
   \$15.00 = \$400.00 \times r \times (10 \div 365)
   \]

   \[
   \$15.00 = \$10.96r
   \]

   \[
   \frac{\$15.00}{\$10.96} = r
   \]

   \[
   1.37 = r
   \]

   Multiply by 100 to convert the rate to a percent.

   \[
   1.37 \times 100 = 137\%
   \]

   The annual interest rate is 137%.

   b) Calculate the daily interest rate.

   \[
   I = Prt
   \]

   \[
   \frac{\$15.00}{\$4000.00} = r
   \]

   \[
   0.00375 = r
   \]

   Multiply by 100 to convert the rate to a percent.

   \[
   0.00375 \times 100 = 0.375\%
   \]

   The daily interest rate is 0.375%.

3. \[
   I = Prt
   \]

   \[
   I = (\$200.00)(3.95)(7 \div 365)
   \]

   \[
   I = \$15.15
   \]

   She paid $15.15 in interest.

4. \[
   I = Prt
   \]

   \[
   I = (\$500.00)(0.0112)(25)
   \]

   \[
   I = \$140.00
   \]

   \[
   A = P + I
   \]

   \[
   A = \$500.00 + \$140.00
   \]

   \[
   A = \$640.00
   \]

   Arleta has to repay $640.00.
5. Calculate how much interest Helen paid.

\[ 781.50 - 750.00 = 31.50 \]

\[ I = Prt \]

\[ 31.50 = (750.00)(.0105)t \]

\[ 31.50 = 7.875t \]

\[ t = \frac{31.50}{7.875} \]

Helen had the money for 4 days.

6. a) \[ I = Prt \]

\[ I = (1000.00)(0.0050)(60) \]

\[ I = 300.00 \]

\[ A = P + I \]

\[ A = 1000.00 + 300.00 \]

\[ A = 1300.00 \]

Hans will have to repay $1300.00.

b) \[ I = Prt \]

\[ 300.00 = (1000.00)(r)(60 ÷ 365) \]

\[ 300.00 = 164.38r \]

\[ r = \frac{300.00}{164.38} \]

\[ r = 1.825 \]

Multiply by 100 to convert the rate to a percent.

\[ 1.825 \times 100 = 182.5\% \]

The annual interest rate is 182.5%.

7. a) Using the Personal Loan Payment Calculator table, look up 9.00% interest in the left-hand column. In that row, look at the entry under the 2-year term: it is $45.68.

\[ \frac{3000.00}{1000.00} \times 45.68 = 137.04 \]

The monthly payment will be $137.04.

Calculate the total amount paid.

\[ 2 \text{ years} \times 12 \text{ months/year} \times 137.04/\text{month} = 3288.96 \]

Calculate the difference between the principal and the total amount paid.

\[ 3288.96 - 3000.00 = 288.96 \]

The finance charge is $288.96.

b) Using the Personal Loan Payment Calculator table, look up 7.25% interest in the left-hand column. In that row, look at the entry under the 3-year term: it is $30.99.

\[ \frac{2125.00}{1000.00} \times 30.99 = 65.85 \]

The monthly payment will be $65.85.

Calculate the total amount paid.

\[ 3 \text{ years} \times 12 \text{ months/year} \times 65.85/\text{month} = 2370.60 \]

Calculate the difference between the principal and the total amount paid.

\[ 2370.60 - 2125.00 = 245.60 \]

The finance charge is $245.60.
c) Using the Personal Loan Payment Calculator table, look up 4.75% interest in the left-hand column. In that row, look at the entry under the 4-year term: it is $22.92.

Divide the amount of the loan ($11,500.00) by $1,000.00 and multiply by $22.92.

\[(11,500.00 \div 1,000.00) \times 22.92 = 263.58\]

The monthly payment will be $263.58.

Calculate the total amount paid.

\[4 \text{ years} \times 12 \text{ months/year} \times 263.58/\text{month} = 12,651.84\]

Calculate the difference between the principal and the total amount paid.

\[12,651.84 - 11,500.00 = 1,151.84\]

The finance charge is $1,151.84.

8. a) Calculate how much Adele will have to borrow.

\[2900.00 - 1100.00 = 1800.00\]

b) Using the Personal Loan Payment Calculator table, look up 6.50% interest in the left-hand column. In that row, look at the entry under the 2-year term: it is $44.55.

Divide the amount of the loan ($1800.00) by $1,000.00 and multiply by $44.55.

\[(1800.00 \div 1,000.00) \times 44.55 = 80.19\]

The monthly payment will be $80.19.

c) Multiply the monthly payment by the amortization period.

\[2 \text{ years} \times 12 \text{ months/year} \times 80.19/\text{month} = 1924.56\]

d) Add the cost of the loan to the amount of her down payment.

\[1100.00 + 1924.56 = 3024.56\]

The car will cost $3024.56.

PRACTISE YOUR NEW SKILLS, p. 322

1. a) Calculate how much interest Shey paid.

\[950.00 - 850.00 = 100.00\]

The term of the loan is 12 days.

\[I = Prt\]

\[100.00 = (850.00)(r)(12)\]

\[100.00 = 10,200.00r\]

\[\frac{100.00}{10,200.00} = r\]

0.0098 = r

Multiply by 100 to convert the rate to a percent.

0.0098 x 100 = 0.98%

The daily interest rate is 0.98%.

b) To calculate the annual interest rate, the term needs to be converted to years. The term will be 12 divided by 365.

\[I = Prt\]

\[100.00 = (850.00)(r)(12 \div 365)\]

\[100.00 = 27.95r\]

\[\frac{100.00}{27.95} = r\]

3.58 = r
Multiply by 100 to convert the rate to a percent.

\[ 3.58 \times 100 = 358\% \]

The annual interest rate is 358%.

2. The interest rate is given as a daily rate, so the term of the investment is also in days.

\[ I = Prt \]
\[ I = ($250.00)(0.0117)(18) \]
\[ I = $52.65 \]

\[ A = P + I \]
\[ A = $250.00 + $52.65 \]
\[ A = $302.65 \]

Carmen will have to repay $302.65.

3. a) Using the Personal Loan Payment Calculator table, look up 8.00% interest in the left-hand column. In that row, look at the entry under the 3-year term: it is $31.34.

Divide the amount of the loan ($2500.00) by $1000.00 and multiply by $31.34.

\[ ($2500.00 + $1000.00) \times $31.34 = $78.35 \]

The monthly payment will be $78.35.

Calculate the total amount paid.

\[ 3 \text{ years} \times 12 \text{ months/year} \times $78.35/\text{month} = $2820.60 \]

Calculate the difference between the principal and the total amount paid.

\[ $2820.60 - $2500.00 = $320.60 \]

The finance charge is $320.60.

b) Using the Personal Loan Payment Calculator table, look up 6.25% interest in the left-hand column. In that row, look at the entry under the 5-year term: it is $19.45.

Divide the amount of the loan ($10 000.00) by $1000.00 and multiply by $19.45.

\[ ($10 000.00 + $1000.00) \times $19.45 = $194.50 \]

The monthly payment will be $194.50.

Calculate the total amount paid.

\[ 5 \text{ years} \times 12 \text{ months/year} \times $194.50/\text{month} = $11 670.00 \]

Calculate the difference between the principal and the total amount paid.

\[ $11 670.00 - $10 000.00 = $1670.00 \]

The finance charge is $1670.00.

c) Using the Personal Loan Payment Calculator table, look up 3.75% interest in the left-hand column. In that row, look at the entry under the 2-year term: it is $43.31.

Divide the amount of the loan ($1500.00) by $1000.00 and multiply by $43.31.

\[ ($1500.00 + $1000.00) \times $43.31 = $64.97 \]

The monthly payment will be $64.97.

Calculate the total amount paid.

\[ 2 \text{ years} \times 12 \text{ months/year} \times $64.97/\text{month} = $1559.28 \]
Calculate the difference between the principal and the total amount paid.

\[ \$1559.28 - \$1500.00 = \$59.28 \]

The finance charge is $59.28.

4. a) Using the Personal Loan Payment Calculator table, look up 7.00\% interest in the left-hand column. In that row, look at the entry under the 2-year term: it is $44.77.

Divide the amount of the loan ($5000.00) by $1000.00 and multiply by $44.77.

\[ (\$5000.00 + \$1000.00) \times \$44.77 = \$223.85 \]

The monthly payment will be $223.85.

b) Calculate the cost of each option.

Option 1:
\[ 2 \text{ years} \times 12 \text{ months/year} \times \$111.37/\text{month} = \$2672.88 \]

Add the down payment plus the cost of the loan.

\[ \$1000.00 + \$2672.88 = \$3672.88 \]

Option 1 costs \$3672.88.

Option 2:
\[ \$50.00 + (\$325.00 \times 12) = \$3950.00 \]

Option 2 costs \$3950.00.

Option 3:
\[ I = Prt \]
\[ I = (\$2499.99)(0.0112)(30) \]
\[ I = \$840.00 \]

\[ A = P + I \]
\[ A = \$2499.99 + \$840.00 \]
\[ A = \$3339.99 \]

Add the down payment plus the cost of the loan.

\[ \$1000.00 + \$3339.99 = \$4339.99 \]

Option 3 costs \$4339.99.

She should choose Option 1.

5. a) Calculate how much money Manon would have to borrow from the bank.

\[ \$3499.99 - \$1000.00 = \$2499.99 \]

Using the Personal Loan Payment Calculator table, look up 6.50\% interest in the left-hand column. In that row, look at the entry under the 2-year term: it is $44.55.

Divide the amount of the loan ($2499.99) by $1000.00 and multiply by $44.55.

\[ (\$2499.99 + \$1000.00) \times \$44.55 = \$111.37 \]

The monthly payment will be $111.37.
1. During the month, Salma made 10 self-service withdrawals and 3 deposits, so she will not be charged any transaction fees.

<table>
<thead>
<tr>
<th>Transaction</th>
<th>Description</th>
<th>Withdrawal</th>
<th>Deposit</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATM</td>
<td>Cash</td>
<td>$200.00</td>
<td></td>
<td>$2879.54</td>
</tr>
<tr>
<td>Direct deposit</td>
<td>Paycheque</td>
<td></td>
<td>$457.21</td>
<td>$3336.75</td>
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<td>Bank card</td>
<td>Groceries</td>
<td>$172.12</td>
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<td>$2946.83</td>
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<tr>
<td>Bank card</td>
<td>Gas</td>
<td>$42.54</td>
<td></td>
<td>$2989.37</td>
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<tr>
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<td>Cheque—reimbursement</td>
<td>$175.64</td>
<td></td>
<td>$3164.99</td>
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<tr>
<td>Bank card</td>
<td>Dinner</td>
<td>$32.42</td>
<td></td>
<td>$3197.41</td>
</tr>
<tr>
<td>ATM</td>
<td>Cash</td>
<td>$100.00</td>
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<td>$3097.41</td>
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<tr>
<td>Auto-withdrawal</td>
<td>Hydro</td>
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<td></td>
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<td>$3666.83</td>
</tr>
<tr>
<td>Auto-withdrawal</td>
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<td>$645.00</td>
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<td>$3310.83</td>
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<td>Bank card</td>
<td>Car repairs</td>
<td>$276.97</td>
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<td>$2633.86</td>
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<tr>
<td>Bank card</td>
<td>Movie</td>
<td>$28.12</td>
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<td>$2662.04</td>
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<tr>
<td>ATM</td>
<td>Cash</td>
<td>$200.00</td>
<td></td>
<td>$2862.04</td>
</tr>
</tbody>
</table>

Salma maintains a minimum balance of $2000.00, so she does not have to pay the $6.00 account fee.

2. a) \( I = Prt \)
\[
I = (\$5000.00)(0.0250)(10)
I = $1250.00
\]

b) \( A = P + I \)
\[
A = \$5000.00 + $1250.00
A = $6250.00
\]

3. \( I = Prt \)
\[
\$82.50 = P \times 0.0110 \times 5 \\
\$82.50 = 0.0550P \\
\$82.50 = P \\
\frac{82.50}{0.0550} = P \\
\$1500.00 = P
\]
The principal was $1500.00.

4. \( A = P \left(1 + \frac{r}{n}\right)^{nt} \)
\[
A = (\$5000.00) \left(1 + \frac{0.0250}{1}\right)^{10} \\
A = (\$5000.00)(1.0250)^{10} \\
A = \$6400.42
\]

5. \( A = P \left(1 + \frac{r}{n}\right)^{nt} \)
\[
A = (\$1000.00) \left(1 + \frac{0.0300}{12}\right)^{12 \times 10} \\
A = \$1349.35 \\
I = A - P \\
I = \$1349.35 - $1000.00 \\
I = $349.35
\]
The investment earned $349.35 in interest.