Business Math Review Chapters 1, 2, 3, 4, 6, 7, 8
Answer Key by Michael Reimer

1) Regular Pay - OT Pay - Payroll

<table>
<thead>
<tr>
<th>Sat</th>
<th>Sun</th>
<th>Mon</th>
<th>Tues</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
<td>7.5</td>
<td>9.5</td>
<td>7.5</td>
<td>8.5</td>
<td>7.5</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Total: 48.5

Regular Pay = 3.75 x $20.75 = $77.81375

OT Pay = 11 x $31.13 = $342.43

Gross Pay = $1120.56

2) Regular Pay - OT Pay - Payroll - Annual Salary

$50000 Annually, paid bi-weekly (26 times a year)

$50000 / 26 = $1923.08

\[ \frac{1923.08}{40 \times 2 \text{ weeks}} = \frac{1923.08}{80} \text{ hours per week} \]

Regular Pay

\[ \frac{1923.08}{80} \times 1.5 = \frac{3606.06}{80} = \] $45.04/hour

OT Pay

1st week = 48 - 40 = 8 OT hours
2nd week = 45 - 40 = 5 OT hours

Total OT Hours = 13

OT Pay = 13 x $36.06 = $468.78

Gross Pay = $1923.08 + $468.78 = $2391.86
3) **Mill Rate**

- Home's value = $300,000
- Tax rate = 6.5% of home's value
- Mill Rate = 1.8434 / 1000

\[
\frac{$300,000 \times 0.065 \times 1.8434}{1000} = $359.46
\]

4) **Taxes - GST + PST**

- Car's sale price = $12,650
- GST = 5% of car's sale price = 0.05 x $12,650 = $632.50
- PST = 8% of car's sale price = 0.08 x $12,650 = $1,012
- Total paid = $12,650 + $632.50 + $1,012 = $14,294.50

5) **Taxes - HST**

- Car's sale price = $12,650
- HST = 14% of car's sale price = 0.14 x $12,650 = $1,771
- Total paid = $12,650 + $1,771 = $14,421

6) **Tax Remittance or Refund**

Sales > Purchases = Remittance

- Purchases = $65,450
- Sales = $97,365
- Sales > Purchases = Remittance

\[
$97,365 - $65,450 = $31,915 	imes 0.05 = $1,595.75
\]
Business Math Review Chapters 1, 2, 3, 4, 6, 7 & 8

Answer key by Michael Reimer

7) Percent Change - Solving for Percent Change

\[ \text{Old: } \$58000 \text{ Enter } \downarrow \]
\[ \text{New: } \$60000 \text{ Enter } \downarrow \]
\[ \% \text{ CH? } \text{PT} \quad 75.862069\% \]

8) Percent Change - Solving for New Value

\[ \text{Old: } 1500 \text{ Enter } \downarrow \]
\[ \text{New? } \text{PT} \quad 1413 \]
\[ \% \text{ CH} - 5.8\% \text{ Enter } \uparrow \]

9) Percent Change - Solving for Old Value

\[ \text{Old? } \text{PT} \quad 350 \]
\[ \text{New: } 35 \text{ Enter } \uparrow \]
\[ \% \text{ CH} - 90\% \text{ Enter } \uparrow \]

10) Currency Conversion

\[ \$1 \times 0.71142 \]
\[ \times 2000 \times \]
\[ \text{X} = \$2000 \times 0.71142 \]
\[ \text{X} = \€1422.88 \]
Business Math Review Chapters 1, 2, 3, 4, 6, 7 + 8

Answer Key by Michael Reimer

1) Indexing

\[ \begin{align*}
&\text{BEGIN} \quad \text{END} \\
&110.2 \quad \leftrightarrow \quad 115.6 \\
&\times \quad \$1,000 \\
&115.6x = 110.2 \times \$1,000 \\
&115.6x = \$110,200 \\
&1x = \$110,200 \\
&115.6 \quad 115.6 \\
&x = \$953.29 \\
\end{align*} \]

Calculating \( r_{oa} \):

2) \( L = \$420 \quad d_1 = 33\frac{3}{4}\% \quad d_2 = 20\% \quad d_3 = 5\% \quad N = ? \quad N = C \)

\[ N = \frac{L}{(1-d_1)(1-d_2)(1-d_3)} \]

\[ N = \frac{\$420}{(1-0.3)(1-0.2)(1-0.05)} \]

\[ N = \frac{\$420}{0.7 \times 0.8 \times 0.95} \]

\[ N = \$212.80 \]

Calculating Selling Price

3) \( S = ? \quad C = \$212.80 \quad E = 25\% \quad 0.255 \quad p = 35\% \quad S = 0.355 \quad S = 0.355 \)

\[ S = C + E + p \]

\[ S = \$212.80 + 0.255 + 0.355 \]

\[ S = \$212.80 + 0.610 \]

\[ 0.65 \]

\[ 0.4 \]

\[ S = \$532 \]
Business Math Review Chapters 1, 2, 3, 4, 6, 7 + 8
Answer key by Michael Reimer

14) Calculating Break-even

\[ BE = C + E \]

or

\[ BE = S - P \]

\[ C = \$212.80 \quad S = \$532 \quad E = 0.25S = 0.25(532) = \$133 \]

\[ P = 0.35S = 0.35(532) = \$186.20 \]

\[ BE = C + E = \$212.80 + \$133 = \$345.80 \]

or

\[ BE = S - P = \$532 - \$186.20 = \$345.80 \]

15) Calculating Reduced Sale Price

\[ N = L (1 - d) \]

\[ L = \$532 \]

\[ d = 45\% = 0.45 \]

\[ N = 7 \]

\[ N = \$532 (1 - 0.45) \]

\[ N = \$532 (0.55) \]

\[ N = \$292.60 \]
Calculating Profit or Loss

\[ S_{\text{Reduced}} - BE = \text{Answer Profit} \]
\[ S_{\text{Reduced}} - \text{Answer Loss} \]

\[ S_{\text{Reduced}} = \$292.60 \]
\[ BE = \$345.80 \]

\[ \$292.60 - \$345.80 = -\$53.20 \text{ (Loss)} \]

Purchasing and Markup Finding Selling Price

\[ N = L (1 - d) \quad \text{and} \quad S = C + M \]

\[ L = \$9.50 \]
\[ d = 15\% = 0.15 \]
\[ N = ? \]

\[ N = \$9.50 (1 - 0.15) = \$9.50 (0.85) = \$8.08 \]

\[ N \text{ becomes } C \quad C = \$8.08 \]

\[ M = 15\% \text{ of Selling Price} = 0.155 \]
\[ S = ? \]

\[ S = \$8.08 + 0.155 \]
\[ -0.155 \]
\[ 0.855 = \$8.08 \quad S = \$9.51 \]
18) Markup Finding Selling Price

\[ S = C + M \]

\[ C = \$150 \]
\[ M = 25\% \text{ of } S = 0.25S \]
\[ 0.25S = 0.25 \times 150 = 37.5 \]
\[ S = \$200 \]

19) Markup Finding Cost

\[ S = C + M \]
\[ S = \$275 \quad M = 12.5\% \text{ of } \text{Cost} = 0.125C \]
\[ 275 = C + 0.125C \]
\[ 275 = 1.125C \]
\[ C = \frac{275}{1.125} = \$244.44 \]

20) Calculating Break-even \( BE = C + P \) or \( BE = S - P \)

\[ C = \$173.18 \quad P = 27\% \text{ of Selling Price} = 0.27S \]
\[ P = 0.27 \times 200 = \$54.90 \]
\[ S = ? \]
\[ S = \$173.18 + 0.27S + 0.27S = \$248.76 \]
\[ BE = \$279.93 - 0.27 \times 200 = \$248.76 \]
Business Math Review Chapters 1, 2, 3, 4, 6, 7, 8
Answer key by Michael Reimer

21) Calculating Reduced Selling Price

\[ N = L (1 - d) \]

\[ L = \$449.50 \quad d = 40\% \quad N = ? \]

\[ N = \$449.50 (1 - 0.40) \]

\[ N = \$449.50 (0.60) \]

\[ N = \$269.70 \]

22) Today \quad 0\% \quad 2\text{Months} \quad \$500 \quad S \quad \frac{t}{2} \quad q \quad 200\%

\[ \frac{t}{2} \]

\[ r = 4.13\% \]

Calculating Principal Using Maturity Value

\[ P = \frac{S}{(1 + rt)} \]

1. \[ P = \frac{\$500}{(1 + 0.0413 \times \frac{1}{2})} = \frac{\$500}{1.00686333} \]

2. \[ P = \frac{\$350}{(1 + 0.0413 \times \frac{9}{12})} = \frac{\$350}{1.030975} \]

3. \[ \$496.58 + \$339.48 = \$836.06 \]

23) Calculating Rate Using Principal and Maturity Value

1. \[ I = S - P \]

2. \[ r = \frac{I}{P} \times 100 \]

\[ S = \$25209.59 \quad P = \$25000 \quad t = \frac{90}{365} \quad I = ? \quad r = ? \]

1. \[ I = \$25209.59 - \$25000 = \$209.59 \]

2. \[ r = \frac{\$209.59}{\$25000 \times \frac{90}{365}} = \frac{\$209.59}{\$16,164.383562} = 3.4\% \]
24) Calculating Profit on Sale of T-Bill: \( p = \frac{s}{(1 + rt)} \)

1. **Calculate Purchase Price**
   \[ s = 50000 \quad r = 2.8391\% = 0.028391 \quad t = \frac{180}{365} \]
   \[ p = \frac{50000}{1 + 0.028391 \times \frac{180}{365}} = \frac{50000}{1.01400104} = 49309.61 \]

2. **Calculate Sale Price**
   \[ s = 50000 \quad r = 23.849\% = 0.023849 \quad t = 180 - 35 = \frac{145}{365} \]
   \[ \text{DT1: March 1, 2015 = 3.0115 Enter} \]
   \[ \text{DT2: April 5, 2015 = 4.0515 Enter} \]
   \[ \text{DRD: 35 days later} \]
   \[ p = \frac{50000}{1 + 0.023849 \times \frac{145}{365}} = \frac{50000}{1.00947426} = 49530.73 \]
   \[ 49530.73 - 49309.61 = 221.12 \]

25) **Line of Credit Interest Amount Calculation** \( I = Prt \)

- **Sept 5**
  \[ P = 25000 \quad t = 18.5 = \frac{18\frac{1}{2}}{365} \quad r = 3.360 \quad \text{t = 30.19 = 12/365} \]
  \[ I = 1.8\% + 1\% = 2.8\% = 0.028 \quad P = 2500 \quad t = 2.8\% = 0.028 \]
  \[ P = 5800 \]

1. **Sept 5 - Sept 18**
   \[ I = 2500 \times 0.028 \times \frac{13}{365} = 2.49 \]

2. **Sept 18 - Sept 30**
   \[ I = 5800 \times 0.028 \times \frac{13}{365} = 5.34 \]

3. **Payment for September = 2.49 + 5.34 = 7.83**
Business Math Review of Chapters 1, 2, 3, 4, 6, 7 & 8
Answer Key by Michael Reiner

26) Calculating Present Value
   \[ N \times r = 3.12 \times 2 = 1.5 \]
   \[ I \times r = 3.12 \times 1.5 \]
   \[ P \times r = 5724.46 \]
   \[ \text{PV} \times r = 650 \]
   \[ \text{PMT} \times 0 \]
   \[ \text{FV} \times 790 \]
   \[ \text{PI} \times 12 \]
   \[ \text{CL} \times 12 \]

27) Calculating Future Value

28) Calculating Replacement Payment

29) Calculating Present Value

30) Calculating Present Value
31) Calculating Future Value and Present Value

Today

\[ \$12,500 \text{ IY} = 4.15\% \text{ Monthly} \]

\[ \text{2 Y} = 7.25\% \text{ Quarterly} \]

\[ \text{PV} = ? \]

\[ \text{FV} = ? \]

\[ N \times 12 = 72 \]

\[ \text{IY} = 4.75\% \]

\[ \text{PV} = \$12,500 \]

\[ \text{PMT} = \] \( \text{PMT} = \) \( \text{PMT} = \)

\[ \text{FV} = \$6,612.67 \]

\[ \text{FV} = \$6,121.67 \]

\[ \text{FV} = \$6,4 \]

\[ \text{FV} = \$4 \]

\[ \text{FV} = \$4 \]

32) Calculating Unknown Payment

-3 Months

\[ N \times 12 = 36 \]

\[ \text{IY} = 8.7\% \]

\[ \text{PV} = \$850 \]

\[ \text{PMT} = \] \( \text{PMT} = \) \( \text{PMT} = \)

\[ \text{FV} = \$968.03 \]

\[ \text{FV} = \$3,500 \]

\[ \text{FV} = \$1500 \]

\[ \text{FV} = ? \]

\[ N \times 12 = 24 \]

Focal Date

\[ N = \frac{365}{12} \times 12 = 30 \]

\[ \text{IY} = 8.7\% \]

\[ \text{PV} = \$850 \]

\[ \text{PMT} = \] \( \text{PMT} = \) \( \text{PMT} = \)

\[ \text{FV} = \$968.03 \]

\[ \text{FV} = \$3,500 \]

\[ \text{FV} = \$1500 \]

\[ \text{FV} = ? \]

\[ \text{IY} = 8.7\% \]

\[ \text{PV} = \$850 \]

\[ \text{PMT} = \] \( \text{PMT} = \) \( \text{PMT} = \)

\[ \text{FV} = \$968.03 \]

\[ \text{FV} = \$3,500 \]

\[ \text{FV} = \$1500 \]

\[ \text{FV} = ? \]
32) 4.  Original = Replacement

\[ \$\text{968.03} + \$\text{3279.69} = \$\text{1600.76} + x \]

\[ \$\text{4247.72} = \$\text{1600.76} + x \]

\[ \$\text{1600.76} - \$\text{1600.76} \]

\[ \$\text{2646.96} = x \]