PART ONE ***Mathematics Fundamentals and Business Applications***

Chapter 1 Review of Arithmetic

Exercise 1.1

A. 1. $12+6\div 3=12+2=\boxed{14}$

2. $(3\times 8-6)\div 2=(24-6)\div 2=18\div 2=\boxed{9}$

3. $(7+4)\times 5-2=11\times 5-2=55-2=\boxed{53}$

4. $5\times 3+2\times 4=15+8=\boxed{23}$

5. $6(7-2)-3(5-3)=6(5)-3(2)=30-6=\boxed{24}$

6. $\dfrac{20-16}{15+5}=\dfrac{4}{20}=\dfrac{1}{5}=\boxed{0.2}$

7. $4(8-5)^2-5(3+2^2)=4(3)^2-5(3+4)=4(9)-5(7)=36-35=\boxed{1}$

8. $(3\times 4-2)^2+(2-2\times 7^2)=(12-2)^2+(2-2\times 49)$

$=10^2+(2-98)=100-96=\boxed{4}$

9. $250(1+0.08)^{10}=250(2.158925)=\boxed{539.73}$

10. $(1+0.04)^4-1=1.169859-1=\boxed{0.17}$

11. $30\times 600-2500-12\times 600=18\ 000-2500-7200=\boxed{8300}$

12. $1-[(1-0.40)(1-0.25)(1-0.05)]=1-[(0.6)(0.75)(0.95)]=1-[0.4275]=0.5725=\boxed{0.57}$

Exercise 1.2

A. 1. $\dfrac{24}{36}=\dfrac{24:2}{36:2}=\dfrac{12}{18}=\dfrac{12:2}{18:2}=\dfrac{6}{9}=\dfrac{6:3}{9:3}=\boxed{\dfrac{2}{3}}$ also $\dfrac{24:12}{36:12}=\dfrac{2}{3}$

2. $\dfrac{28}{56}=\dfrac{28:2}{56:2}=\dfrac{14}{28}=\dfrac{14:2}{28:2}=\dfrac{7}{14}=\dfrac{7:7}{14:7}=\boxed{\dfrac{1}{2}}$ also $\dfrac{28:28}{56:28}=\dfrac{1}{2}$

3. $\dfrac{210}{360}=\dfrac{210:10}{360:10}=\dfrac{21}{36}=\dfrac{21:3}{36:3}=\boxed{\dfrac{7}{12}}$ also $\dfrac{210:30}{360:30}=\dfrac{7}{12}$

4. $\dfrac{360}{225}=\dfrac{360:5}{225:5}=\dfrac{72}{45}=\dfrac{72:9}{45:9}=\boxed{\dfrac{8}{5}}$ also $\dfrac{360:45}{225:45}=\dfrac{8}{5}$

5. $\frac{144}{360}=\frac{144:2}{360:2}=\frac{72}{180}=\frac{72:9}{180:9}=\frac{8}{20}=\frac{8:4}{20:4}=\boxed{\frac{2}{5}}$ also $\frac{144:72}{360:72}=\frac{2}{5}$

6. $\frac{25}{365}=\frac{25:5}{365:5}=\boxed{\frac{5}{73}}$

7. $\frac{365}{73}=\frac{365:73}{73:73}=\boxed{\frac{5}{1}}$

8. $\frac{365}{219}=\frac{365:73}{219:73}=\boxed{\frac{5}{3}}$

B. 1. $\frac{11}{8}=\boxed{1.375}$

2. $\frac{7}{4}=\boxed{1.75}$

3. $\frac{5}{3}=1.666667=\boxed{1.\dot{6}}$

4. $\frac{5}{6}=0.833333=\boxed{0.8\dot{3}}$

5. $\frac{11}{6}=1.833333=\boxed{1.8\dot{3}}$

6. $\frac{7}{9}=0.777778=\boxed{0.\dot{7}}$

7. $\frac{13}{12}=1.083333=\boxed{1.083\dot{3}}$

8. $\frac{19}{15}=1.266667=\boxed{1.26\dot{6}}$

C. 1. $3\frac{3}{8}=\boxed{3.375}$

2. $3\frac{2}{5}=\boxed{3.4}$

3. $8\frac{1}{3}=8.333333=\boxed{8.\dot{3}}$

4. $16\frac{2}{3}=16.666667=\boxed{16.\dot{6}}$

5. $33\frac{1}{3}=33.333333=\boxed{33.\dot{3}}$

6. $83\frac{1}{3} = 83.333333 = \boxed{83.\dot{3}}$

7. $7\frac{7}{9} = 7.777778 = \boxed{7.\dot{7}}$

8. $7\frac{1}{12} = 7.083333 = \boxed{7.083\dot{3}}$

D. 1. $\boxed{\$5.63}$

2. $\boxed{\$17.45}$

3. $\boxed{\$18.00}$

4. $\boxed{\$253.49}$

5 $\boxed{\$57.70}$

6. $\boxed{\$3.09}$

7. $\boxed{\$13.00}$

8. $\boxed{\$40.00}$

E. 1. $25\ 000(15-8)-146\ 000 = 25\ 000(7)-146\ 000 = 175\ 000-146\ 000 = \boxed{29\ 000}$

2. $(300\times 8000)-(180\times 8000)-63\ 000 = 2\ 400\ 000-1\ 440\ 000-63\ 000 = \boxed{897\ 000}$

3. $1-[(1-0.4)(1-0.25)(1-0.08)] = 1-[(0.6)(0.75)(0.92)] = 1-[0.414] = \boxed{0.586}$

4. $1-[(1-0.32)(1-0.15)(1-0.12)] = 1-[(0.68)(0.85)(0.88)] = 1-[0.50864] = \boxed{0.49136}$

5. $1500+\frac{1500}{0.05} = 1500+30\ 000 = \boxed{31\ 500}$

6. $\frac{\$54}{0.12\times\frac{225}{365}} = \frac{\$54}{0.12\times 0.616438} = \frac{\$54}{0.073973} = \boxed{\$730}$

7. $\frac{264}{4400\times\frac{146}{365}} = \frac{264}{4400\times 0.4} = \frac{264}{1760} = \boxed{0.15}$

8. $\$620\left(1+0.14\times\frac{45}{365}\right) = \$620(1+0.017260) = \$620(1.017260) = \boxed{\$630.70}$

9. $\$375\left(1+0.16\times\frac{292}{365}\right) = \$375(1+0.128) = \$375(1.128) = \boxed{\$423}$

10. $\dfrac{\$250\ 250}{1+0.15\times\frac{330}{365}} = \dfrac{\$250\ 250}{1+0.135616} = \dfrac{\$250\ 250}{1.135616} = \boxed{\$220\ 364.90}$

11. $\dfrac{\$2358}{1+0.12\times\frac{146}{365}} = \dfrac{\$2358}{1+0.048} = \dfrac{\$2358}{1.048} = \boxed{\$2250}$

12. $\$1000\left[\dfrac{(1+0.03)^{24}-1}{0.03}\right] = 1000\left[\dfrac{1.032794}{0.03}\right] = 1000[34.426470] = \boxed{\$34\ 426.47}$

13. $\$70(1+0.02)\left[\dfrac{(1+0.02)^{20}-1}{0.02}\right] = 70(1.02)\left[\dfrac{0.485947}{0.02}\right]$

$= 71.4[24.29737] = \boxed{\$1734.83}$

14. $\$50\dfrac{[1-(1+0.075)^{-8}]}{0.075} = \dfrac{50[1-(0.560702)]}{0.075} = \dfrac{50[0.439297]}{0.075} = 50[5.857303]$

$= \boxed{\$292.87}$

***Exercise* 1.3**

A. 1. $64\% = \dfrac{64}{100} = \boxed{0.64}$

2. $300\% = \dfrac{300}{100} = \boxed{3}$

3. $2.5\% = \dfrac{2.5}{100} = \boxed{0.025}$

4. $0.1\% = \dfrac{0.1}{100} = \boxed{0.001}$

5. $0.5\% = \dfrac{0.5}{100} = \boxed{0.005}$

6. $85\% = \dfrac{85}{100} = \boxed{0.85}$

7. $250\% = \dfrac{250}{100} = \boxed{2.5}$

8. $4.8\% = \dfrac{4.8}{100} = \boxed{0.048}$

9. $7.5\% = \dfrac{7.5}{100} = \boxed{0.075}$

10. $0.9\% = \dfrac{0.9}{100} = \boxed{0.009}$

11. $6.25\% = \frac{6.25}{100} = \boxed{0.0625}$

12. $99\% = \frac{99}{100} = \boxed{0.99}$

13. $225\% = \frac{225}{100} = \boxed{2.25}$

14. $0.05\% = \frac{0.05}{100} = \boxed{0.0005}$

15. $8\frac{1}{4}\% = \frac{8.25}{100} = \boxed{0.0825}$

16. $\frac{1}{2}\% = \frac{0.5}{100} = \boxed{0.005}$

17. $112\frac{1}{2}\% = \frac{112.5}{100} = \boxed{1.125}$

18. $9\frac{3}{8}\% = \frac{9.375}{100} = \boxed{0.09375}$

19. $\frac{3}{4}\% = \frac{0.75}{100} = \boxed{0.0075}$

20. $162\frac{1}{2}\% = \frac{162.5}{100} = \boxed{1.625}$

21. $\frac{2}{5\%} = \frac{0.4}{100} = \boxed{0.004}$

22. $\frac{1}{4\%} = \frac{0.25}{100} = \boxed{0.0025}$

23. $\frac{1}{40}\% = \frac{0.025}{100} = \boxed{0.00025}$

24. $137\frac{1}{2}\% = \frac{137.5}{100} = \boxed{1.375}$

25. $\frac{5}{8}\% = \frac{0.625}{100} = \boxed{0.00625}$

26. $0.875\% = \frac{0.875}{100} = \boxed{0.00875}$

27. $2\frac{1}{4}\% = \frac{2.25}{100} = \boxed{0.0225}$

28. $16\frac{2}{3}\% = \frac{16.\dot{6}}{100} = \boxed{0.1\dot{6}}$

29. $116\frac{2}{3}\% = \frac{116.\dot{6}}{100} = \boxed{1.1\dot{6}}$

30. $183\frac{1}{3}\% = \frac{183.\dot{3}}{100} = \boxed{1.8\dot{3}}$

31. $83\frac{1}{3\%} = \frac{83.\dot{3}}{100} = \boxed{0.8\dot{3}}$

32. $66\frac{2}{3}\% = \frac{66.\dot{6}}{100} = \boxed{0.\dot{6}}$

B. 1. $25\% = \frac{25}{100} = \boxed{\frac{1}{4}}$

2. $62\frac{1}{2}\% = \frac{62.5}{100} = \frac{625}{1000} = \boxed{\frac{5}{8}}$

3. $175\% = \frac{175}{100} = \boxed{\frac{7}{4}}$

4. $5\% = \frac{5}{100} = \boxed{\frac{1}{20}}$

5. $37\frac{1}{2}\% = \frac{37.5}{100} = \frac{375}{1000} = \boxed{\frac{3}{8}}$

6. $75\% = \frac{75}{100} = \boxed{\frac{3}{4}}$

7. $4\% = \frac{4}{100} = \boxed{\frac{1}{25}}$

8. $8\% = \frac{8}{100} = \boxed{\frac{2}{25}}$

9. $40\% = \frac{40}{100} = \boxed{\frac{2}{5}}$

10. $87\frac{1}{2\%} = \frac{87.5}{100} = \frac{875}{1000} = \boxed{\frac{7}{8}}$

11. $250\% = \frac{250}{100} = \boxed{\frac{5}{2}}$

12. $2\% = \frac{2}{100} = \boxed{\frac{1}{50}}$

13. $12\frac{1}{2}\% = \frac{12.5}{100} = \frac{125}{1000} = \boxed{\frac{1}{8}}$

14. $60\% = \frac{60}{100} = \boxed{\frac{3}{5}}$

15. $2.25\% = \frac{2.25}{100} = \frac{225}{10\ 000} = \boxed{\frac{9}{400}}$

16. $0.5\% = \frac{0.5}{100} = \frac{5}{1000} = \boxed{\frac{1}{200}}$

17. $\frac{1}{8}\% = \frac{1}{8(100)} = \boxed{\frac{1}{800}}$

18. $33\frac{1}{3}\% = \frac{100}{3}\% = \frac{100}{3(100)} = \boxed{\frac{1}{3}}$

19. $\frac{3}{4\%} = \frac{3}{4(100)} = \boxed{\frac{3}{400}}$

20. $66\frac{2}{3}\% = \frac{200}{3}\% = \frac{200}{3(100)} = \boxed{\frac{2}{3}}$

21. $6.25\% = \frac{6.25}{100} = \frac{625}{10\ 000} = \boxed{\frac{1}{16}}$

22. $0.25\% = \frac{0.25}{100} = \frac{25}{10\ 000} = \boxed{\frac{1}{400}}$

23. $16\frac{2}{3}\% = \frac{50}{3}\% = \frac{50}{3(100)} = \boxed{\frac{1}{6}}$

24. $7.5\% = \frac{7.5}{100} = \frac{75}{1000} = \boxed{\frac{3}{40}}$

25. $0.75\% = \frac{0.75}{100} = \frac{75}{10\ 000} = \boxed{\frac{3}{400}}$

26. $\frac{7}{8}\% = \frac{7}{8(100)} = \boxed{\frac{7}{800}}$

27. $0.1\% = \frac{0.1}{100} = \boxed{\frac{1}{1000}}$

28. $\frac{3}{5}\% = \frac{3}{5(100)} = \boxed{\frac{3}{500}}$

29. $2.5\% = \frac{2.5}{100} = \frac{25}{1000} = \boxed{\frac{1}{40}}$

30. $133\frac{1}{3}\% = \frac{400}{3}\% = \frac{400}{3}(100) = \boxed{\frac{4}{3}}$

31. $183\frac{1}{3}\% = \frac{550}{3}\% = \frac{550}{3(100)} = \boxed{\frac{11}{6}}$

32. $166\frac{2}{3}\% = \frac{500}{3}\% = \frac{500}{3(100)} = \boxed{\frac{5}{3}}$

C. 1. $3.5 = 3.5(100) = \boxed{350\%}$

2. $0.075 = 0.075(100) = \boxed{7.5\%}$

3. $0.005 = 0.005(100) = \boxed{0.5\%}$

4. $0.375 = 0.375(100) = \boxed{37.5\%}$

5. $0.025 = 0.025(100) = \boxed{2.5\%}$

6. $2 = 2(100) = \boxed{200\%}$

7. $0.125 = 0.125(100) = \boxed{12.5\%}$

8. $0.001 = 0.001(100) = \boxed{0.1\%}$

9. $0.225 = 0.225(100) = \boxed{22.5\%}$

10. $0.008 = 0.008(100) = \boxed{0.8\%}$

11. $1.45 = 1.45(100) = \boxed{145\%}$

12. $0.0225 = 0.0225(100) = \boxed{2.25\%}$

13. $0.0025 = 0.0025(100) = \boxed{0.25\%}$

14. $0.995 = 0.995(100) = \boxed{99.5\%}$

15. $0.09 = 0.09(100) = \boxed{9\%}$

16. $3 = 3(100) = \boxed{300\%}$

17. $\frac{3}{4} = 0.75(100) = \boxed{75\%}$

18. $\frac{3}{25} = 0.12(100) = \boxed{12\%}$

19. $\frac{5}{3} = 1.666667(100) = \boxed{166.\dot{6}\%}$

20. $\frac{7}{200} = 0.035(100) = \boxed{3.5\%}$

21. $\frac{9}{200} = 0.045(100) = \boxed{4.5\%}$

22. $\frac{5}{8} = 0.625(100) = \boxed{62.5\%}$

23. $\frac{3}{400} = 0.0075(100) = \boxed{0.75\%}$

24. $\frac{5}{6} = 0.833333(100) = \boxed{83.\dot{3}\%}$

25. $\frac{9}{800} = 0.01125(100) = \boxed{1.125\%}$

26. $\frac{7}{6} = 1.166667(100) = \boxed{116.\dot{6}\%}$

27. $\frac{3}{8} = 0.375(100) = \boxed{37.5\%}$

28. $\frac{11}{40} = 0.275(100) = \boxed{27.5\%}$

29. $\frac{4}{3} = 1.333333(100) = \boxed{133.\dot{3}\%}$

30. $\frac{9}{400} = 0.0225(100) = \boxed{2.25\%}$

31. $\frac{13}{20} = 0.65(100) = \boxed{65\%}$

32. $\frac{4}{5} = 0.8(100) = \boxed{80\%}$

Exercise 1.4

A. 1. Total weight $= 1\frac{1}{3} + 2\frac{3}{4} + 1\frac{5}{8} + 3\frac{5}{6} = 1.\dot{3} + 2.75 + 1.625 + 3.8\dot{3} = 9.541\dot{6}$ ounces

Total selling value of 4 pieces $= \$1569 \times 9.541\dot{6} =$ $\boxed{\$14\ 970.88}$

2. Total hours $= 15\frac{1}{2} + 13\frac{3}{4} + 18\frac{1}{2} + 21\frac{1}{4} + 22\frac{3}{4}$

$= 15.5 + 13.75 + 18.5 + 21.25 + 22.75$

$= 91.75$

Total cost of labour $= 91.75 \times 25.75 =$ $\boxed{\$2362.56}$

3. Assessed value $= \frac{6}{11} \times 56\ 100 = 6 \times 5100 = \$30\ 600$

Property tax $= 30\ 600 \times \frac{3.75}{100} =$ $\boxed{\$1147.50}$

4. Retail value $= 0.83\frac{1}{3}¢ \times 2700 = \$0.8\dot{3} \times 2700$

$= \$2250.00$

Discount $= \frac{3}{8} \times 2250.00 = \$843.75$

Credit received $= 2250.00 - 843.75 =$ $\boxed{\$1406.25}$

5.

$64 \times \$0.75$	=	\$ 48.00
$54 \times 83\frac{1}{3}¢ = 54 \times \$0.8\dot{3}$	=	45.00
$72 \times \$0.375$	=	27.00
$42 \times \$1.3\dot{3} = 42 \times \$1.\dot{3}$	=	56.00
Total	=	\$176.00

6.

$96 \times \$0.875$	=	\$ 84.00
$330 \times 16\frac{2}{3}¢ = 330 \times \$0.1\dot{6}$	=	55.00
$144 \times \$1.75$	=	252.00
$240 \times \$1.66\dot{6} = 240 \times \$1.\dot{6}$	=	400.00
Total	=	\$791.00

B. 1. $1100 \times 0.597 = \$656.70$
$1600 \times 0.667 = \$1067.20$
$1400 \times 0.765 = \underline{\$1071.00}$
$\text{Total cost} = \$2794.90$

$$\text{Average cost per litre} = \frac{\$2794.90}{4100} = \$0.681683$$
$$= \$0.68$$
$$= \boxed{68¢}$$

2. (a) $56 + 64 + 70 + 54 = 244$

$\text{Average number of litres} = 244 \div 4 = \boxed{61}$

(b) $\text{Total cost} = 56 \times \$0.99 = \$55.44$
$64 \times \$1.065 = \$68.16$
$70 \times \$1.015 = \$71.05$
$54 \times \$1.045 = \underline{\$\ 56.43}$
$\$251.08$

$\text{Average cost per litre} = 251.08/244 = \$1.029016 = \boxed{\$1.029}$

(c) $\text{Average cost per km} = \$1.029016/8.75 = \$0.117602 = \boxed{\$0.118}$

3. $\text{Weighted hours} = 3 \times 4 + 5 \times 2 + 2 \times 6 + 4 \times 2 + 4 \times 1 + 2 \times 6$
$= 12 + 10 + 12 + 8 + 4 + 12$
$= 58$

$\text{Total hours} = 3 + 5 + 2 + 4 + 4 + 2 = 20$

$$\text{Grade-point average} = \frac{58}{20} = \boxed{2.9}$$

4. Weighted investment:

January 1 – February 28:	$\$7500 \times 2$	$= \$15\,000$
March 1 – July 31:	6600×5	$= 33\,000$
August 1 – August 31:	8100×1	$= 8\,100$
September 1 – December 31:	7800×4	$= \underline{31\,200}$
		$\$87\,300$

$\text{Average investment balance} = \$87\,300 \div 12 = \boxed{\$7275}$

5. (a) Simple average of unit prices

$$= \frac{10.00 + 10.60 + 11.25 + 9.50 + 9.20 + 12.15}{6} = \frac{62.70}{6} = \boxed{\$10.45}$$

(b) $\text{Number of units purchased} = \dfrac{\text{Amount invested}}{\text{Unit price}}$

Date	Amount Invested	Unit Price	Number of Units Purchased
February 1	200.00	10.00	$\dfrac{200.00}{10.00} = 20.000$
March 1	200.00	10.60	$\dfrac{200.00}{10.60} = 18.868$
April 1	200.00	11.25	$\dfrac{200.00}{11.25} = 17.778$
May 1	200.00	9.50	$\dfrac{200.00}{9.50} = 21.053$
June 1	200.00	9.20	$\dfrac{200.00}{9.20} = 21.739$
July 1	200.00	12.15	$\dfrac{200.00}{12.15} = 16.461$
	Total number of units purchased		$\boxed{115.899}$

(c) $\text{Average cost of units purchased} = \dfrac{1200.00}{115.899} = \boxed{\$10.35}$

(d) $\text{Value on July 31} = 115.899(11.90) = \boxed{\$1379.20}$

***Exercise* 1.5**

A. 1. (a) $\text{Annual salary} = \$31\,824$

$$\text{Semi-monthly payment} = \frac{31\,824}{24} = \boxed{\$1326}$$

(b) $\text{Weekly pay} = \dfrac{31\,824}{52} = \$612$

$$\text{Hourly rate} = \frac{612}{36} = \boxed{\$17}$$

(c) $\begin{aligned} \text{Regular pay} &= \$1326 \\ \text{Overtime pay} = 11 \times 17 \times 1.5 &= \underline{\quad 280.50} \\ \text{Gross pay} &= \boxed{\$1606.50} \end{aligned}$

2. (a) Annual salary $= \$43\ 875$

$$\text{Biweekly pay} = \frac{43\ 875}{26} = \boxed{\$1687.50}$$

(b) $\text{Weekly pay} = \dfrac{1687.50}{2} = \$843.75$

$$\text{Hourly rate} = \frac{843.75}{37.5} = \boxed{\$22.50}$$

(c) Regular biweekly pay $= \$1687.50$

Overtime pay $= 8 \times 22.50 \times 1.5 = 270.00$

Gross pay $= \boxed{\$1957.50}$

3. (a) Monthly pay $= \$2011.10$

Yearly pay $= 2011.10 \times 12 = \$24\ 133.20$

Weekly pay $= 24\ 133.20 \div 52 = \$464.10$

Hourly rate of pay $= 464.10 \div 35 = \boxed{\$13.26}$

(b) Regular pay for May $= \$2011.10$

Overtime pay $= 7.75 \times 13.26 \times 1.5 = 154.15$

Gross pay $= \boxed{\$2165.25}$

4. (a) Semimonthly pay $= \$975.00$

Yearly salary $= 975.00 \times 24 = \$23\ 400.00$

Weekly gross pay $= 23\ 400 \div 52 = \$450.00$

Hourly rate $= 450.00 \div 40 = \boxed{\$11.25}$

(b) Gross pay $= \$1118.44$

Regular pay $= 975.00$

Overtime pay $= \$143.44$

Number of overtime hours $= (143.44 \div 1.5) \div 11.25 = 8.500148 = \boxed{8.5}$

5. Total hours $= 45$

Regular hours $= 40$

Overtime hours $= 5$

At time-and-a-half, 5 overtime hours are equivalent to $5 \times 1.5 = 7.5$ regular hours

$$\text{Rate of pay} = \frac{\$680.20}{47.5} = \boxed{\$14.32}$$

6. (a) Biweekly payment = \$2123.00

Annual salary = $2123.00 \times 22 = 46\,706$

Daily pay = $46\,706 \div 200 = \$233.53$

Hourly rate = $233.53 \div 7.5 = \boxed{\$31.14}$

(b) Regular pay = \$2123.00

Less: two days = 233.53×2 = 467.06

Gross pay = $\boxed{\$1655.94}$

7. Gross sales = \$12 660.00

Less: returns = 131.20

Net sales = \$12 528.80

Gross commission = $12\,528.80 \times 0.0975$ = \$1221.56

Less: drawings = 720.00

Amount due = $\boxed{\$501.56}$

8. Net sales = \$16 244.00

Commission: $8\frac{1}{4}\%$ on first \$6000.00 = \$495.00

$9\frac{3}{4}\%$ on next \$6000.00 = 585.00

11.5% on \$(16 244.00 − 12 000.00) = 488.06

Total commission = $\boxed{\$1568.06}$

9. Gross sales = \$24 250.00

Less: returns = 855.00

Net sales = \$23 395.00

Commission: 4.5% on first \$10 000 = $0.045 \times 10\,000.00$ = \$ 450.00

6% on next \$5000 = 0.06×5000.00 = 300.00

8% on remaining \$8395 = 0.08×8395.00 = 671.60

Total commission = $\boxed{\$1421.60}$

10. (a) Sales = \$8125.00

Base salary on quota of \$8500 = $\boxed{\$825.00}$

(b) Sales = \$10 150.00

Base salary on quota of \$8500 = \$825.00

Commission = $6\frac{1}{2}\%$ on \$1650 = $0.065 \times \$1650$ = 107.25

Gross earnings = \$932.25

11. (a) Commission at 6.5% on sales of \$5830 = 0.065 × \$5830 = \$378.95.

This is less than \$400 guarantee, therefore weekly salary = \$400

(b) Commission at 6.5% on sales of \$8830 = $0.065 \times \$8830 = \$573.95$

This exceeds \$400 guarantee, therefore weekly salary = \$573.95

12. Gross sales = \$31 240.00

Less: returns = 3% of \$31 240.00 = 937.20

Net sales = \$30 302.80

Rate of commission = $\frac{1590.90}{30\,302.80} = 0.0525$ = 5.25%

13. Gross earnings = \$566.25

Less: base salary = 450.00

Commission: = \$116.25

Sales for week = \$6550

Quota: = 5000

Commission sales = \$1550

Rate of commission = $\frac{116.25}{1550} = 0.075 =$ 7.5%

14 Net sales = $\frac{\$\,\text{Commission}}{\text{Rate}} = \frac{\$2036.88}{0.1125} = \$18\,105.60$

Net sales = gross sales − returns

$18\,105.60 = S - 0.08S$

$0.92S = 18\,105.60$

$S = 19\,680$

Gross sales were \$19 680

15. Gross earnings = \$637.50
Less: Base salary = 464.00
Commission = \$173.50

$$\text{Commission sales} = \frac{173.50}{0.0875} = \$1982.86$$

Sales for week = \$4800 + \$1982.86 = \$6782.86

16. **Method A** Regular hours = 40×12.60 = \$ 504.00
Overtime pay = $3.5 \times 12.60 \times 1.50$ = 66.15
$6 \times 12.60 \times 2$ = 151.20
Gross earnings = \$ 721.35

Method B At regular rate: 49.5×12.60 = \$ 623.70
Overtime premium: $3.5 \times 12.60 \times 0.50$ = 22.05
$6 \times 12.60 \times 1$ = 75.60
Gross earnings = \$721.35

***Exercise* 1.6**

1.

Month	*GST collected 5% of sales*	*GST paid 5% of purchases*	*GST payable* (*GST receivable*)
January	\$27 345.00	\$7391.60	\$19 953.40
February	12 200.00	3475.00	8725.00
March	29 400.00	43 300.00	(13 900.00)
April	32 515.00	22 500.00	10 015.00
May	7840.00	4904.90	2935.10
5-month totals	\$109 300.00	\$81 571.50	\$27 728.50

Cook's owes the government \$27 728.50.

2. Riza's revenue of \$28 350 includes 5% GST.

$$\text{GST taxable revenue} = \frac{28\,350}{1.05} = \$27\,000$$

GST collected = 5% of \$27 000 = \$1350

GST paid = 5% of \$8000 = \$400

Riza owes the Canada Revenue Agency \$(1350 − 400) = \$950.00

3. Savings on GST = 5% of $780 = 0.05(780) = $\boxed{\$39.00}$

4. Cost of shirt = \$15.00
   GST in Regina = 5% of \$15.00 = 0.05(15.00) = 0.75
   PST = 6% of \$15.00 = 0.06(15.00) = 0.90
   Consumer pays = $\boxed{\$16.65}$

5. At Blackcomb, B.C.
   Cost of ski pass = \$84.00
   GST = 5% of \$84.00 = 0.05(84.00) = 4.20
   PST = 7% of \$84.00 = 0.07(84.00) = 5.88
   Amount paid at Blackcomb, B.C. = \$94.08

   At Mont Tremblant, Que.
   Cost of ski pass = \$84.00
   GST = 5% of \$84.00 = 0.05(84.00) = 4.20
   PST = 9.975% of \$84.00 = 0.09975(84.00) = 8.38
   Amount paid at Mont Tremblant = \$96.58
   Difference = 96.58 – 94.08 = $\boxed{\$2.50}$

6. Total cost in Toronto
   Retail price = \$625.00
   HST = 13% of \$625.00 = 0.13(625) = 81.25
   Total cost in Toronto = \$706.25

   Total cost in Calgary
   Retail price = \$625.00
   GST = 5% of \$625.00 = 0.05(625.00) = 31.25
   PST = nil
   Total cost in Calgary = \$656.25
   Difference = PST = $\boxed{\$\ 50.00}$

7. Purchase price of the first item = \$78.92 × 0.25 = \$19.73
   Purchase price of the second item, including 5% GST = 78.92 – 19.73 = \$59.19
   Purchase price of the second item = \$59.19/1.05 = \$56.371429
   GST paid = \$59.19 – 56.371429 = 2.818571 = \$2.82

8. Property tax = $125\,000\left(\frac{22.751}{1000}\right) = \boxed{\$2843.88}$

9. Property tax = 225 000(0.019368) = $\boxed{\$4357.80}$

10. Semi-annual tax rate $= \dfrac{1420.79}{196\,000.00} = 0.007249$

    Semi-annual tax rate $= 0.007249(1000) = 7.248929$

    The annual tax rate $= 2(7.248929) = \boxed{14.497857}$

11. (a) Total expenditure $= \$(3\,050\,000 + 2\,000\,000 + 250\,000 + 700\,000 + 850\,000)$
    $= \$6\,850\,000$

    Total residential property tax $= 0.80(6\,850\,000) = \boxed{\$5\,480\,000}$

    (b) Tax rate per \$1000 $= \dfrac{5\,480\,000}{250\,000\,000}(1000) = \boxed{21.92}$

    (c) Property tax $= \$175\,000\left(\dfrac{21.92}{1000}\right) = \boxed{\$3836.00}$

Business Math News Box

Newfoundlanders will Notice the HST Increase on Big Ticket Items

Solutions:

1. Current price (including 15% HST): \$450 000

   Price prior to January 1, 2016 (including 13% HST):

   \$450 000 / (1.15) × (1.13) = \$442 173.91

2. HST payable – (0.15)(\$180 000 000) = \$27 000 000

3. Resale home: Tax exempt = no tax

   New home: HST payable = (0.15)(\$325 000) = \$48 750

Review Exercise

1. (a) $32 - 24 \div 8 = 32 - 3 = \boxed{29}$

   (b) $(48 - 18) \div 15 - 10 = 30 \div 15 - 10 = 2 - 10 = \boxed{-8}$

   (c) $(8 \times 6 - 4) \div (16 - 4 \times 3) = (48 - 4) \div (16 - 12) = 44 \div 4 = \boxed{11}$

   (d) $9(6 - 2) - 4(3 + 4) = 9(4) - 4(7) = 36 - 28 = \boxed{8}$

   (e) $\dfrac{108}{0.12 \times \frac{216}{365}} = \dfrac{108}{0.12 \times 0.591781} = \dfrac{108}{0.071014} = \boxed{\$1520.83}$

(f) $\dfrac{288}{2400\times\frac{292}{365}}=\dfrac{288}{2400\times 0.8}=\dfrac{288}{1920}=\boxed{0.15}$

(g) $320\left(1+0.10\times\dfrac{225}{365}\right)=320(1+0.061644)=320(1.061644)=\boxed{339.73}$

(h) $1000\left(1-0.12\times\dfrac{150}{365}\right)=1000(1-0.049315)=1000(0.950685)=\boxed{950.68}$

(i) $\dfrac{660}{1+0.14\times\frac{144}{365}}=\dfrac{660}{1+0.055233}=\dfrac{660}{1.055233}=\boxed{625.45}$

(j) $\dfrac{1120}{1-0.13\times\frac{292}{365}}=\dfrac{1120}{1-0.104}=\dfrac{1120}{0.896}=\boxed{1250}$

2. (a) $185\%=\boxed{1.85}$

(b) $7.5\%=\boxed{0.075}$

(c) $0.4\%=\boxed{0.004}$

(d) $0.025\%=\boxed{0.00025}$

(e) $1\dfrac{1}{4}\%=1.25\%=\boxed{0.0125}$

(f) $\dfrac{3}{4}\%=0.75\%=\boxed{0.0075}$

(g) $162\dfrac{1}{2}\%=162.5\%=\boxed{1.625}$

(h) $11\dfrac{3}{4}\%=11.75\%=\boxed{0.1175}$

(i) $8\dfrac{1}{3}\%=\dfrac{8.\dot{3}}{100}=\boxed{0.08\dot{3}}$

(j) $83\dfrac{1}{3}\%=\dfrac{83.\dot{3}}{100}=\boxed{0.8\dot{3}}$

(k) $266\dfrac{2}{3}\%=\dfrac{266.\dot{6}}{100}=\boxed{2.\dot{6}}$

(l) $10\dfrac{3}{8}\%=10.375\%=\boxed{0.10375}$

3. (a) $50\% = \frac{50}{100} = \boxed{\frac{1}{2}}$

(b) $37\frac{1}{2}\% = \frac{37.5}{100} = \frac{375}{1000} = \boxed{\frac{3}{8}}$

(c) $16\frac{2}{3}\% = \frac{16\frac{2}{3}}{100} = \frac{\frac{50}{3}}{\frac{100}{1}} = \boxed{\frac{1}{6}}$

(d) $166\frac{2}{3}\% = \frac{100 + 66\frac{2}{3}}{100} = 1 + \frac{2}{3} = \boxed{\frac{5}{3}}$

(e) $\frac{1}{2}\% = \frac{\frac{1}{2}}{100} = \frac{1}{2} \times \frac{1}{100} = \boxed{\frac{1}{200}}$

(f) $7.5\% = \frac{7.5}{100} = \frac{75}{1000} = \boxed{\frac{3}{40}}$

(g) $0.75\% = \frac{3}{4}\% = \boxed{\frac{3}{400}}$

(h) $\frac{5}{8}\% = \frac{5}{800} = \boxed{\frac{1}{160}}$

4. (a) $2.25 = 2.25 \times 100 = \boxed{225\%}$

(b) $0.02 = 0.02 \times 100 = \boxed{2\%}$

(c) $0.009 = 0.009 \times 100 = \boxed{0.9\%}$

(d) $0.1275 = 0.1275 \times 100 = \boxed{12.75\%}$

(e) $\frac{5}{4} = \frac{5}{4} \times 100 = \boxed{125\%}$

(f) $\frac{11}{8} = 1.375 = 1.375 \times 100 = \boxed{137.5\%}$

(g) $\frac{5}{200} = 0.025 = 0.025 \times 100 = \boxed{2.5\%}$

(h) $\frac{7}{25} = \frac{28}{100} = \boxed{28\%}$

5. (a) 150% of 140

$= 1.5 \times 140 = \boxed{210}$

(b) 3% of 240

$= 0.03 \times 240 = \boxed{7.2}$

(c) $9\frac{3}{4}\%$ of 2000

$= 0.0975 \times 2000 = \boxed{195}$

(d) 0.9% of 400

$= 0.009 \times 400 = \boxed{3.6}$

6. (a) $4\frac{1}{3} + 3\frac{3}{4} + 5\frac{1}{2} + 6\frac{5}{8}$

$= 4.\dot{3} + 3.75 + 5.5 + 6.625 = \boxed{20.208\dot{3}\,\text{kg}}$

(b) $20.208\dot{3} \times 1.20 = \boxed{\$24.25}$

(c) $20.208\dot{3} \div 4 = 5.052083\dot{3} = \boxed{5.05\,\text{kg}}$

(d) $24.25 \div 4 = 6.0625 = \boxed{\$6.06}$

7.

$56 \times \$0.625$	=	$\boxed{\$\ 35.00}$
$180 \times 83\frac{1}{3}¢ = 180 \times \$0.83\dot{3}$	=	$\boxed{\$150.00}$
$126 \times \$1.16\dot{6}$	=	$\boxed{\$147.00}$
$144 \times \$1.75$	=	$\boxed{\$252.00}$
Total	=	$\boxed{\$584.00}$

8. (a) $\dfrac{30.45 + 20.20 + 16.40 + 14.50}{4} = \dfrac{81.55}{4} = 20.3875 = \boxed{\$20.39}$

(b)

30.45×2	=	$\$\ 60.90$
20.20×6	=	$\$121.20$
16.40×9	=	$\$147.60$
14.50×13	=	$\$188.50$
30	=	$\$518.20$

Average rate $= \dfrac{\$518.20}{30} = \boxed{\$17.27}$

9. January 1 – May 31: $15\,000 \times 5 = \$\ 75\,000$
   June 1 – July 31: $13\,000 \times 2 = 26\,000$
   August 1 – October 31: $11\,500 \times 3 = 34\,500$
   November 1 – December 31: $15\,500 \times 2 = 31\,000$
   Total $12 = \$166\,500$
   Average monthly investment $= \dfrac{\$166\,500}{12} = \boxed{\$13\,875}$

10. January 1 – March 31: $12\,000 \times 3 = \$\ 36\,000$
    April 1 – May 31: $14\,400 \times 2 = 28\,800$
    June 1 – September 30: $12\,960 \times 4 = 51\,840$
    October 1 – December 31: $15\,840 \times 3 = 47\,520$
    Total $12 = \$164\,160$
    Average monthly investment $= \dfrac{\$164\,160}{12} = \boxed{\$13\,680}$

11. (a) Monthly remuneration $= \dfrac{34\,944}{12} = \boxed{\$2912.00}$

    (b) Weekly pay $= 34\,944 \div 52 = \$672.00$
    Hourly rate $= 672.00 \div 35 = \boxed{\$19.20}$

    (c) Gross pay for month $= 3387.20$
    Regular gross pay $= 2912.00$
    Overtime pay $= 475.20$
    Overtime hours $= 475.20 \div (19.20 \times 1.5) = \boxed{16.5}$

12. (a) Semimonthly pay $= 23\,999.04 \div 24 = \boxed{\$999.96}$

    (b) Weekly pay $= 23\,999.04 \div 52 = \$461.52$
    Hourly rate $= 461.52 \div 36 = \boxed{\$12.82}$

    (c) Regular earnings $= \$999.96$
    Overtime pay $= 12 \times 12.82 \times 1.5 = 230.76$
    Gross earnings $= \boxed{\$1230.72}$

13. (a) Gross sales $= 11\,160$
Less: returns $= \underline{120}$
Net sales $= 11\,040$

Commission: 4% of \$6000.00 $= \$240$
8% of \$3000.00 $= 240$
12.5% of $\$[11\,040 - 9000]$ $= \underline{255}$
Gross earnings $= \boxed{\$735}$

(b) Average hourly rate $= 735 \div 43 = \boxed{\$17.09}$

14. (a) Regular earnings $= 44 \times 11.20 = \$492.80$
Overtime pay $= 6.5 \times 11.20 \times 1.5 = \underline{109.20}$
Gross earnings $= \boxed{\$602.00}$

(b) Overtime premium $= 6.5 \times 11.20 \times 0.5 = \boxed{\$36.40}$

15. (a) Base salary on quota of \$8000 $= \$340.00$
Commission $= 4.75\%$ on \$3340 $= \underline{158.65}$
Gross earnings $= \boxed{\$498.65}$

(b) Hourly rate $= 498.65 \div 35 = \boxed{\$14.25}$

16. Gross earnings $= \$441.30$
Base salary $= \underline{375.00}$
Commission $= \$66.30$
Commission sales $= 6560.00 - 5000 = \$1560.00$
Rate of commission $= 66.30 \div 1560.00 = 0.0425 = \boxed{4.25\%}$

17. Net sales $= 2101.05 \div 0.105 = \$20\,010.00$
Net sales = Gross sales − Returns
$20\,010.00$ = Gross sales − 8% of Gross sales
$20\,010.00$ = 92% of Gross sales

$$\text{Gross sales} = \frac{20\,010}{0.92} = \boxed{\$21\,750}$$

18. Hours worked $= 47$
Regular hours $= \underline{40}$
Overtime hours $= 7$
7 overtime hours are equivalent to $7 \times 1.5 = 10.5$ regular hours.
Total hours paid at regular rate $= 40 + 10.5 = 50.5$
Hourly rate of pay $= \dfrac{577.72}{50.5} = \boxed{\$11.44}$

19. (a) Annual salary $= 1088.75 \times 24 = \$26\ 130$
Weekly pay $= 26\ 130 \div 52 = \$502.50$
Hourly rate of pay $= 502.50 \div 37.5 = \boxed{\$13.40}$

(b) Gross earnings $= \$1252.55$
Regular earnings $= \underline{1088.75}$
Overtime pay $= \$163.80$
Overtime hourly rate $= 13.40 \times 1.50 = \$20.10$
Overtime hours $= 163.80 \div 20.10 = \boxed{8.15}$

20. Gross earnings $= \$328.54$
Less: base salary $= \underline{280.00}$
Commission $= \$\ 48.54$
Commission sales $= 48.54 \div 0.06 = \$809.00$
Net sales $= 5000.00 + 809.00 = \$5809.00$
Gross sales $= 5809.00 + 136.00 = \boxed{\$5945.00}$

21. Gross earnings $= \$662.30$
Regular earnings $= 35 \times 10.80 = \underline{378.00}$
Overtime pay $= \$284.30$
Overtime hours $= 284.30 \div (10.80 \times 1.5) = 17.549383$
Number of hours worked $= 35 + 17.549383 = \boxed{52.55}$

22. GST collected $= 5\%$ of $\$76\ 000 = 0.05(76\ 000) = \$3800.00$
GST paid $= 5\%$ of $\$14\ 960 = 0.05(14\ 960) = \underline{748.00}$
GST remittance $\boxed{\$3052.00}$

23. GST collected:

Parts : 5% of \$ 75 000

Labour : 5% of \$ 65 650

Total : $5\% \text{ of } \$140\ 650 = 0.05(140\ 650) = \$7032.50$

GST paid :

Parking fees : 5% of \$ 4 000

Supplies : 5% of \$55 000

Utilities : 5% of \$ 2 000

Other : 5% of \$ 3 300

Total : $5\% \text{ of } \$64\ 300 = 0.05(64\ 300) = \underline{\$3215.00}$

GST remittance \$3817.50

24. Amount paid in Kelowna, B.C.

$= \text{Retail Price} + 5\%\ \text{GST} + 7\%\ \text{PST}$

$= 1868 + 0.05(1868) + 0.07(1868)$

$= 1868 + 93.40 + 130.76 = 2092.16$

Amount paid in Kenora, Ont.

$= \text{Retail Price} + 13\%\ \text{HST}$

$= 1868 + 0.13(1868)$

$= 1868 + 242.84 = 2110.84$

The difference $= 2110.84 - 2092.16 =$ \$18.68

25. Property tax in Ripley $= 150\,000\left(\dfrac{20.051}{1000}\right) = \$3007.65$

Property tax in Amberly $= 135\,000\left(\dfrac{22.124}{1000}\right) = \$2986.74$

The person in Ripley pays \$20.91 more in property tax.

26. (a) Tax rate $= \dfrac{45\,567\,000}{975\,500\,000}(1000) =$ 46.71143

(b) Property tax $= 35\,000\left(\dfrac{46.71143}{1000}\right) =$ \$1634.90

(c) Increase in tax rate $= \dfrac{2\,000\,000}{975\,500\,000}(1000) =$ 2.050231

(d) Additional property tax $= 35\,000\left(\dfrac{2.050231}{1000}\right) =$ \$71.76

Self-Test

1. (a) $4320\left(1+0.18\times\dfrac{45}{365}\right)=4320(1+0.022192)=\boxed{4415.87}$

   (b) $2160\left(0.15\times\dfrac{105}{365}\right)=2160(0.043151)=\boxed{93.21}$

   (c) $2880\left(1-0.12\times\dfrac{285}{365}\right)=2880(1-0.093699)=\boxed{2610.15}$

   (d) $\dfrac{410.40}{0.24\times\frac{135}{365}}=\dfrac{410.40}{0.088767}=\boxed{4623.33}$

   (e) $\dfrac{5124}{1-0.09\times\frac{270}{365}}=\dfrac{5124}{0.933424658}=\boxed{5489.46}$

2. (a) $175\%=\dfrac{175}{100}=\boxed{1.75}$

   (b) $\dfrac{3}{8}\%=\dfrac{3}{8}\times\dfrac{1}{100}=\dfrac{3}{800}=\boxed{0.00375}$

3. (a) $2\dfrac{1}{2}\%=\dfrac{5}{2}\%=\dfrac{5}{2}\times\dfrac{1}{100}=\dfrac{5}{200}=\boxed{\dfrac{1}{40}}$

   (b) $116\dfrac{2}{3}\%=100\%+16\dfrac{2}{3}\%=1+\dfrac{16\frac{2}{3}}{100}=1+\dfrac{\frac{50}{3}}{100}=1+\dfrac{50}{300}$

   $=1+\dfrac{1}{6}=\boxed{\dfrac{7}{6}}$

4. (a) $1.125=1.125\times100=\boxed{112.5\%}$

   (b) $\dfrac{9}{400}=0.0225=0.0225\times100=\boxed{2.25\%}$

5. $72\times\$1.25 = \$\ 90.00$

   $84\times16\dfrac{2}{3}¢=84\times\$0.16\dot{6} = \$\ 14.00$

   $40\times\$0.875 = \$\ 35.00$

   $48\times\$1.3\dot{3}=48\times\$1.\dot{3} = \$\ 64.00$

   Total $\boxed{\$203.00}$

6.

	$5 \times \$9$	$=$	$\$\ 45$
	$6 \times \$7$	$=$	$\$\ 42$
	$3 \times \$8$	$=$	$\$\ 24$
	$6 \times \$6$	$=$	$\$\ 36$
Total	20	$=$	$\$147$

$$\text{Average cost} = \frac{147}{20} = \boxed{\$7.35}$$

7. $$\text{Total size} = \left(5\frac{1}{4} + 6\frac{1}{3} + 4\frac{3}{8} + 3\frac{5}{6}\right) \text{ sq. metres}$$
$$= (5.25 + 6.\dot{3} + 4.375 + 3.8\dot{3}) \text{ sq. metres}$$
$$= 19.791\dot{6} \text{ sq. metres}$$
$$\text{Sales value} = 15\,120 \times 19.791\dot{6}$$
$$= \boxed{\$299\,250.00}$$

8.

January 1 – February 28:	$7200 \times$	2	$= \$14\,400$
March 1 – July 31:	$6720 \times$	5	$= \quad 33\,600$
August 1 – September 30:	$7320 \times$	2	$= \quad 14\,640$
October 1 – December 31:	$7440 \times$	3	$= \quad 22\,320$
Total		12	$\$84\,960$

$$\text{Average monthly balance} = \frac{84\,960}{12} = \boxed{\$7080}$$

9. $\text{Annual salary} = 1040 \times 24 = \$24\,960.00$
$\text{Weekly pay} = 24\,960.00 \div 52 = \$480.00$
$\text{Hourly rate of pay} = 480.00 \div 40 = \boxed{\$12.00}$

10. $\text{Net sales} = 0.885 \times 5880.00 = \$5203.80$
$$\text{Commission rate} = \frac{806.59}{5203.80} = 0.155 = \boxed{15.5\%}$$

11.

Weekly pay $= 26\ 478.40 \div 52$	$=$	$\$509.20$
Hourly pay $= 509.20 \div 38$	$=$	$\$13.40$
Regular monthly pay $= 26\ 478.40 \div 12$	$=$	$\$2206.53$
Overtime earnings $= 13.40 \times 8.75 \times 1.5$	$=$	175.88
Gross pay	$=$	$\boxed{\$2382.41}$

12. Total hours $= 8.25 + 8.25 + 9.5 + 11.5 + 7.25 = 44.75$
Regular hours $= 8 + 8 + 8 + 8 + 7.25 = 39.25$
Overtime hours $= 0.25 + 0.25 + 1.5 + 3.5 = 5.50$
Regular pay $= 39.25 \times 16.60$ = \$651.55
Overtime pay $= 5.5 \times 16.60 \times 1.5 =$ 136.95
Gross earnings = \$788.50

13. Total hours = 52.5
Regular hours = 44.0
Overtime hours = 8.5
At time-and-a-half, 8.5 overtime hours are equivalent to $8.5 \times 1.5 = 12.75$ regular hours
$$\text{Hourly rate of pay} = \frac{783.15}{56.75} = \$13.80$$

14. Base salary on first \$4500 = \$400.00
Commission on next $\$2000 = 0.11 \times 2000$ = 220.00
Commission on additional sales $= (8280 - 6500) \times 0.15 = 1780 \times 0.15 =$ 267.00
Gross earnings = \$887.00

15.

Total value	\$6400.00 + \$20.00	= \$6420.00	
GST	5% of \$6420.00	\$321.00	
Manitoba PST	8% of \$6420.00	513.60	834.60
Total purchase price			\$7254.60

16.

Purchase price	\$17.95
Less discount	2.50
Net price	\$15.45
Add shipping charge	1.45
Total cost before taxes	\$16.90

HST 15% of \$16.90 = 2.535 = \$2.54

Final purchase price is \$19.44

17. $\text{Property Tax} = \text{Assessed Value} \times \text{Tax Rate}$

$$2502.50 = \text{Assessed Value} \times \frac{55}{1000}$$

$$\text{Assessed Value} = \frac{2502.50(1000)}{55} = \boxed{\$45\ 500.00}$$

18. $\text{Assessed value} = \frac{2}{13} \times \$130\ 000 = \$20\ 000$

$$\text{Property tax} = \$20\ 000 \times \frac{32.5}{1000} = \boxed{\$650}$$

Challenge Problems

1. Purchase price of the first item = $\$821.40 \times 0.29 = \$238.206$

   Purchase price of the second item, including 5% GST and 7% PST = \$821.40 – 238.206 = \$583.194

   Purchase price of the second item = \$583.194 / 1.12 = \$520.708929

   Total GST paid = \$520.708929(0.05) = \$26.035446 = \$26.04

   BC PST paid on second item = \$520.708929(0.07) = \$36.449625 = \$36.45

   BC PST paid on first item = (\$238.206 / 1.07)(0.07) = \$15.583570 = \$15.58

   Total BC PST paid = \$36.45 + \$15.58 = \$52.03

2.

	Test score	*Weight*	*Final grade contribution*
Test 1	60	30%	$60(0.30) = 18$
Test 2	50	30%	$50(0.30) = 15$
Final exam	?	40%	?
Final mark			70

Final exam contribution to final mark $= 70 - (18 + 15) = 70 - 33 = 37$

$$\text{Final examination mark required} = \frac{37}{0.40} = \boxed{92.5\%}$$

Case Study

1.

HST collected	13% of \$28 000	\$3640.00
HST paid	13% of \$ 4000	520.00
HST remittance		\$3120.00

2. (a) HST by Quick Method

HST on sales = 185 000 × 0.13 = $24 050.00

Purchases:

Goods for resale (185 000 × 47%) × 1.13 =	$98 253.50
Other expenses (48 000 – 42 000) × 1.13 =	6 780.00
Total taxable goods and expenses	105 033.50
Input tax credits = 13/113 × 105 033.50 =	$12 083.50

Remittance by Quick Method: $24 050.00 – 12 083.50 = $11 966.50

(b) HST by Standard Method

HST collected	13% of $185 000	$24 050.00
HST paid on purchases and taxable services		
13% of (47% of $185 000)	$11 303.50	
13% of ($48 000 – $42 000)	780.00	12 083.50
Remittance by Standard Method		$11 966.50

(c) Difference in remittances by method = $11 966.50 – $11 966.50 = $0.00

3.

Line 101		$ 486 530.00
Line 103	13% of $486 530	63 248.90
Line 104		0.00
Line 105		63 248.90
Line 106	13% of $239 690	31 159.70
Line 107		0.00
Line 108		31 159.70
Line 109	63 248.90 – 31 159.70	32 089.20
Line 110	3120 × (12)	37 440.00
Line 111		0.00
Line 112		37 440.00
Line 113	32 089.20 – 37 440.00	–5350.80
Line 114		5350.80
Line 115		0

Refund Claimed is $5350.80