

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. $\frac{20 - 16}{15 + 5} = \frac{4}{20} = \frac{1}{5} = \boxed{0.2}$
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. $\frac{24}{36} = \frac{24:2}{36:2} = \frac{12}{18} = \frac{12:2}{18:2} = \frac{6}{9} = \frac{6:3}{9:3} = \frac{2}{3}$ also $\frac{24:12}{36:12} = \frac{2}{3}$
2. $\frac{28}{56} = \frac{28:2}{56:2} = \frac{14}{28} = \frac{14:2}{28:2} = \frac{7}{14} = \frac{7:7}{14:7} = \frac{1}{2}$ also $\frac{28:28}{56:28} = \frac{1}{2}$
3. $\frac{210}{360} = \frac{210:10}{360:10} = \frac{21}{36} = \frac{21:3}{36:3} = \frac{7}{12}$ also $\frac{210:30}{360:30} = \frac{7}{12}$
4. $\frac{360}{225} = \frac{360:5}{225:5} = \frac{72}{45} = \frac{72:9}{45:9} = \frac{8}{5}$ also $\frac{360:45}{225:45} = \frac{8}{5}$

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

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

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

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

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

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

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

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

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

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

$$7. \quad \frac{13}{12} = 1.083333 = \boxed{1.08\dot{3}}$$

$$8. \quad \frac{19}{15} = 1.266667 = \boxed{1.2\dot{6}}$$

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

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

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

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

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

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

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

$$8. \quad 7\frac{1}{12} = 7.083333 = \boxed{7.08\dot{3}}$$

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

$$2. \quad \boxed{\$17.45}$$

$$3. \quad \boxed{\$18.00}$$

$$4. \quad \boxed{\$253.49}$$

$$5. \quad \boxed{\$57.70}$$

$$6. \quad \boxed{\$3.09}$$

$$7. \quad \boxed{\$13.00}$$

$$8. \quad \boxed{\$40.00}$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$= \boxed{\$292.87}$$

Exercise 1.3

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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 = $0.83\frac{1}{3}\text{¢} \times 2700 = \$0.8\dot{3} \times 2700$
 $= \$2250.00$

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

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

5.	$64 \times \$0.75$	=	$\$48.00$
	$54 \times 83\frac{1}{3}\text{¢} = 54 \times \$0.8\dot{3}$	=	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.	$96 \times \$0.875$	=	$\$84.00$
	$330 \times 16\frac{2}{3}\text{¢} = 330 \times \$0.1\dot{6}$	=	55.00
	$144 \times \$1.75$	=	252.00
	$240 \times \$1.6\dot{6} = 240 \times \$1.\dot{6}$	=	400.00
	Total	=	$\$791.00$

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

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

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

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

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

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

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: $6600 \times 5 = 33\,000$
 August 1 – August 31: $8100 \times 1 = 8\,100$
 September 1 – December 31: $7800 \times 4 = \underline{31\,200}$
 $\$87\,300$

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

5. (a) Simple average of unit prices

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

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

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

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

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

Exercise 1.5

A. 1. (a) Annual salary = \$31 824

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

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

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

$$(c) \text{ Regular pay} = \$1326$$

$$\text{Overtime pay} = 11 \times 17 \times 1.5 = \underline{280.50}$$

$$\text{Gross pay} = \text{\$1606.50}$$

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

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

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

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

(c) Regular biweekly pay = \$1687.50

$$\text{Overtime pay} = 8 \times 22.50 \times 1.5 = \underline{270.00}$$

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

3. (a) Monthly pay = \$2011.10

$$\text{Yearly pay} = 2011.10 \times 12 = \$24\,133.20$$

$$\text{Weekly pay} = 24\,133.20 \div 52 = \$464.10$$

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

(b) Regular pay for May = \$2011.10

$$\text{Overtime pay} = 7.75 \times 13.26 \times 1.5 = \underline{154.15}$$

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

4. (a) Semimonthly pay = \$975.00

$$\text{Yearly salary} = 975.00 \times 24 = \$23\,400.00$$

$$\text{Weekly gross pay} = 23\,400 \div 52 = \$450.00$$

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

(b) Gross pay = \$1118.44

$$\text{Regular pay} = \underline{975.00}$$

$$\text{Overtime pay} = \$143.44$$

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

5. Total hours = 45

$$\text{Regular hours} = 40$$

$$\text{Overtime hours} = 5$$

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 = $233.53 \times 2 = 467.06$
 Gross pay = $\boxed{\$1655.94}$
7. Gross sales = \$12 660.00
 Less: returns = $\underline{131.20}$
 Net sales = \$12 528.80
 Gross commission = $12\,528.80 \times 0.0975 = \1221.56
 Less: drawings = $\underline{720.00}$
 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) = $\underline{488.06}$
 Total commission = $\boxed{\$1568.06}$
9. Gross sales = \$24 250.00
 Less: returns = $\underline{855.00}$
 Net sales = \$23 395.00
 Commission: 4.5% on first \$10 000 = $0.045 \times 10\,000.00 = \450.00
 6% on next \$5000 = $0.06 \times 5000.00 = 300.00$
 8% on remaining \$8395 = $0.08 \times 8395.00 = \underline{671.60}$
 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 = $\boxed{\$932.25}$

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

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

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

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

12. Gross sales = \$31 240.00
 Less: returns = 3% of \$31 240.00 = $\underline{937.20}$
 Net sales = \$30 302.80

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

13. Gross earnings = \$566.25
 Less: base salary = $\underline{450.00}$
 Commission: = \$116.25
 Sales for week = \$6550
 Quota: = $\underline{5000}$
 Commission sales = \$1550

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

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 $\boxed{\$19\,680}$

15. Gross earnings = \$637.50
 Less: Base salary = 464.00
 Commission = \$173.50
 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 × 12.60 × 1.50 = 66.15
 6 × 12.60 × 2 = 151.20
 Gross earnings = \$ 721.35

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

Exercise 1.6

1.

<i>Month</i>	<i>GST collected 5% of sales</i>	<i>GST paid 5% of purchases</i>	<i>GST payable (GST receivable)</i>
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.

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 = 5% of \$15.00 = $0.05(15.00) = 0.75$
 Consumer pays = $\boxed{\$16.50}$
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 = $\underline{\$96.58}$
 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 \times 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 = $125\,000 \left(\frac{22.751}{1000} \right) = \boxed{\$2843.88}$

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

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

$$\text{Semi-annual tax rate} = 0.007249(1000) = 7.248929$$

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

$$11. \quad \begin{aligned} \text{(a) Total expenditure} &= \$ (3\,050\,000 + 2\,000\,000 + 250\,000 + 700\,000 + 850\,000) \\ &= \$6\,850\,000 \end{aligned}$$

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

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

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

Business Math News Box

Newfoundlanders will Notice the HST Increase on Big Ticket Items

Solutions:

$$1. \quad \text{Current price (including 15% HST): } \$450\,000$$

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

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

$$2. \quad \text{HST payable} - (0.15)(\$180\,000\,000) = \$27\,000\,000$$

$$3. \quad \text{Resale home: Tax exempt} = \text{no tax}$$

$$\text{New home: HST payable} = (0.15)(\$325\,000) = \$48\,750$$

Review Exercise

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

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

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

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

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

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

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

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

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

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

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) $1\frac{1}{4}\% = 1.25\% = \boxed{0.0125}$

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

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

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

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

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

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

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

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) $20.208\dot{3} \div 4 = 5.05208\dot{3} = \boxed{5.05 \text{ kg}}$
- (d) $24.25 \div 4 = 6.0625 = \boxed{\$6.06}$
7. $56 \times \$0.625 = \boxed{\$ 35.00}$
- $180 \times 83\frac{1}{3}\text{¢} = 180 \times \$0.8\dot{3} = \boxed{\$150.00}$
- $126 \times \$1.1\dot{6} = \boxed{\$147.00}$
- $144 \times \$1.75 = \boxed{\$252.00}$
- Total $= \boxed{\$584.00}$
8. (a) $\frac{30.45 + 20.20 + 16.40 + 14.50}{4} = \frac{81.55}{4} = 20.3875 = \boxed{\$20.39}$
- (b) $30.45 \times 2 = \$ 60.90$
 $20.20 \times 6 = \$121.20$
 $16.40 \times 9 = \$147.60$
 $\underline{14.50 \times 13 = \$188.50}$
 $30 = \$518.20$
- Average rate $= \frac{\$518.20}{30} = \boxed{\$17.27}$

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:	$15\,500 \times 2 =$	<u>$31\,000$</u>
Total	$12 =$	$\$166\,500$

$$\text{Average monthly investment} = \frac{\$166\,500}{12} = \boxed{\$13\,875}$$

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:	$15\,840 \times 3 =$	<u>$47\,520$</u>
Total	$12 =$	$\$164\,160$

$$\text{Average monthly investment} = \frac{\$164\,160}{12} = \boxed{\$13\,680}$$

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

(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 = 120
 Net sales = 11 040

Commission: 4% of \$6000.00 = \$ 240
 8% of \$3000.00 = 240
 12.5% of \$[11 040 – 9000] = 255
 Gross earnings = \$735

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

14. (a) Regular earnings = $44 \times 11.20 = \$492.80$
 Overtime pay = $6.5 \times 11.20 \times 1.5 = 109.20$
 Gross earnings = \$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 = 158.65
 Gross earnings = \$498.65

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

16. Gross earnings = \$441.30
 Base salary = 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
 $20\,010.00 = \text{Gross sales} - 8\% \text{ of Gross sales}$
 $20\,010.00 = 92\% \text{ of Gross sales}$

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

18. Hours worked = 47
 Regular hours = 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 = $\frac{577.72}{50.5} = \boxed{\$11.44}$

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

23. GST collected:

Parts : 5% of \$ 75 000

Labour : 5% of \$ 65 650

Total : 5% 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% of \$64 300 = $0.05(64\ 300) = \$3215.00$

GST remittance \$3817.50

24. Amount paid in Kelowna, B.C.

= Retail Price + 5% GST + 7% PST

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

= $1868 + 93.40 + 130.76 = 2092.16$

Amount paid in Kenora, Ont.

= Retail Price + 13% HST

= $1868 + 0.13(1868)$

= $1868 + 242.84 = 2110.84$

The difference = $2110.84 - 2092.16 = \boxed{\$18.68}$

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

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

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

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

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

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

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

Self-Test

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

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

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

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

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

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

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

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

$$(b) \quad 116\frac{2}{3}\% = 100\% + 16\frac{2}{3}\% = 1 + \frac{16\frac{2}{3}}{100} = 1 + \frac{\frac{50}{3}}{100} = 1 + \frac{50}{300} \\ = 1 + \frac{1}{6} = \boxed{\frac{7}{6}}$$

$$4. \quad (a) \quad 1.125 = 1.125 \times 100 = \boxed{112.5\%}$$

$$(b) \quad \frac{9}{400} = 0.0225 = 0.0225 \times 100 = \boxed{2.25\%}$$

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

$$84 \times 16\frac{2}{3}\text{¢} = 84 \times \$0.1\dot{6} = \$ 14.00$$

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

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

$$\text{Total} \quad \boxed{\$203.00}$$

$$\begin{array}{r}
 6. \quad 5 \times \$9 = \$ 45 \\
 \quad 6 \times \$7 = \$ 42 \\
 \quad 3 \times \$8 = \$ 24 \\
 \quad \underline{6 \times \$6 = \$ 36} \\
 \text{Total } 20 = \$147
 \end{array}$$

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

$$\begin{aligned}
 7. \quad \text{Total size} &= \left(5\frac{1}{4} + 6\frac{1}{3} + 4\frac{3}{8} + 3\frac{5}{6} \right) \text{ sq. metres} \\
 &= (5.25 + 6.\dot{3} + 4.375 + 3.8\dot{3}) \text{ sq. metres} \\
 &= 19.791\dot{6} \text{ sq. metres}
 \end{aligned}$$

$$\begin{aligned}
 \text{Sales value} &= 15\,120 \times 19.791\dot{6} \\
 &= \boxed{\$299\,250.00}
 \end{aligned}$$

$$\begin{array}{r}
 8. \quad \text{January 1 – February 28:} \quad 7200 \times 2 = \$14\,400 \\
 \quad \text{March 1 – July 31:} \quad \quad \quad 6720 \times 5 = \quad 33\,600 \\
 \quad \text{August 1 – September 30:} \quad 7320 \times 2 = \quad 14\,640 \\
 \quad \text{October 1 – December 31:} \quad 7440 \times 3 = \underline{\quad 22\,320} \\
 \quad \text{Total} \quad \quad \quad \quad \quad \quad \quad 12 \quad \$84\,960
 \end{array}$$

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

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

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

$$\begin{aligned}
 11. \quad \text{Weekly pay} &= 26\,478.40 \div 52 = \$509.20 \\
 \text{Hourly pay} &= 509.20 \div 38 = \$13.40 \\
 \text{Regular monthly pay} &= 26\,478.40 \div 12 = \$2206.53 \\
 \text{Overtime earnings} &= 13.40 \times 8.75 \times 1.5 = \underline{\quad 175.88} \\
 \text{Gross pay} &= \boxed{\$2382.41}
 \end{aligned}$$

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 = $5.5 \times 16.60 \times 1.5 = \underline{136.95}$

Gross earnings = $\boxed{\$788.50}$

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

Hourly rate of pay = $\frac{783.15}{56.75} = \boxed{\$13.80}$

14. Base salary on first \$4500 = \$400.00

Commission on next \$2000 = $0.11 \times 2000 = 220.00$

Commission on additional sales = $(8280 - 6500) \times 0.15 = 1780 \times 0.15 = \underline{267.00}$

Gross earnings = $\boxed{\$887.00}$

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 $\boxed{\$7254.60}$

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 13% of \$16.90 = \$2.20

Final purchase price is $\boxed{\$19.10}$

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

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

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

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

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

Challenge Problems

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

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

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

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

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

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

$$\text{Total BC PST paid} = \$36.45 + \$15.58 = \$52.03$$

2.

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

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

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

Case Study

1. HST collected	13% of \$28 000	\$3640.00
HST paid	13% of \$ 4000	<u>520.00</u>
HST remittance		<u><u>\$3120.00</u></u>

2. (a) HST by Quick Method

HST on sales = $185\,000 \times 0.13 = \$24\,050.00$

Purchases:

Goods for resale $(185\,000 \times 47\%) \times 1.13 = \$98\,253.50$

Other expenses $(48\,000 - 42\,000) \times 1.13 = \underline{6\,780.00}$

Total taxable goods and expenses 105\,033.50

Input tax credits = $13/113 \times 105\,033.50 = \underline{\$12\,083.50}$

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 = $\$11\,966.50 - \$11\,966.50 = \boxed{\$0.00}$

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