#### **Business Mathematics in Canada 8th Edition Jerome Solutions Manual**

Full Download: https://alibabadownload.com/product/business-mathematics-in-canada-8th-edition-jerome-solutions-manual/

# 1 Review and Applications of Basic Mathematics

#### Exercise 1.1

1. 
$$20 - 4 \times 2 - 8 = 20 - 8 - 8 = \frac{4}{2}$$
  
2.  $18 \div 3 + 6 \times 2 = 6 + 12 = \underline{18}$   
3.  $(20 - 4) \times 2 - 8 = 16 \times 2 - 8 = 32 - 8 = \underline{24}$   
4.  $18 \div (3 + 6) \times 2 = 18 \div 9 \times 2 = 2 \times 2 = \frac{4}{2}$   
5.  $20 - (4 \times 2 - 8) = 20 - (8 - 8) = \underline{20}$   
6.  $(18 \div 3 + 6) \times 2 = (6 + 6) \times 2 = \underline{24}$   
7.  $54 - 36 + 4 + 2^2 = 54 - 9 + 4 = \underline{49}$   
8.  $(5 + 3)^2 - 3^2 \div 9 + 3 = 8^2 - 9 \div 9 + 3 = 64 - 1 + 3 = \underline{66}$   
9.  $(54 - 36) + (4 + 2)^2 = 18 \div 6^2 = 18 \div 36 = \underline{0.5}$   
10.  $5 + (3^2 - 3)^2 \div (9 + 3) = 5 + (9 - 3)^2 \div 12 = 5 + 36 \div 12 = 5 + 3 = \underline{8}$   
11.  $\frac{8^2 - 4^2}{(4 - 2)^3} = \frac{64 - 16}{2^3} = \frac{48}{8} = \underline{6}$   
12.  $\frac{(8 - 4)^2}{4 - 2^3} = \frac{4^2}{4 - 8} = \frac{16}{-4} = -\underline{4}$   
13.  $3(6 + 4)^2 - 5(17 - 20)^2 = 3 \times 10^2 - 5(-3)^2 = 3 \times 100 - 5 \times 9 = 300 - 45 = \underline{255}$   
14.  $(4 \times 3 - 2)^2 + (4 - 3 \times 2^2) = (12 - 2)^2 + (4 - 3 \times 4) = 10^2 \div (4 - 12) = 100 \div (-8) = -\underline{12.5}$   
15.  $[(20 + 8 \times 5) - 7 \times (-3)] \div 9 = (20 + 40 + 21) \div 9 = 81 \div 9 = \underline{9}$   
16.  $5 \left[ 19 + (5^2 - 16)^2 \right]^2 = 5 \left[ 19 + (25 - 16)^2 \right]^2 = 5(19 + 81)^2 = 5 \times 100^2 = \underline{50,000}$   
17.  $\$100(1 + 0.06 \times \frac{46}{366}) = \$100(1 + 0.00739726) = \underline{\$100.74}$   
18.  $\frac{\$200}{1 + 0.09 \times \frac{4}{12}} = \frac{\$200}{1.025} = \frac{\$200}{1.1025} = \underline{\$453.51}$   
20.  $\$1000(1 + 0.02)^3 = \$1000(1.02^3) = \$1000(1.061208) = \underline{\$1061.21}$   
21.  $\$100 \left[ \frac{(1 + 0.04)^2 - 1}{0.04} \right] = \$100 \left( \frac{1.04^2 - 1}{0.04} \right) = \$100 \left( \frac{0.0816}{0.04} \right) = \underline{\$204.00}$ 

#### This is sample only, Download all chapters at: AlibabaDownload.com

## Exercise 1.1 (continued)

22. 
$$\$300 \left[ \frac{1 - \frac{1}{(1 + 0.03)^2}}{0.03} \right] = \$300 \left( \frac{1 - \frac{1}{1.0609}}{0.03} \right) = \$300 \left( \frac{1 - 0.942596}{0.03} \right) = \underbrace{\$574.04}$$

#### **Concept Questions (Section 1.2)**

- You must retain at least one more figure than you require in the answer. To achieve fourfigure accuracy in the answer, you must retain a minimum of <u>five figures</u> in the values used in the calculations. B)
- 2. We want six-figure accuracy in the answer. Therefore, values used in the calculations must be accurate to at least <u>seven figures</u>. B)
- 3. We want seven-figure accuracy in the answer. Therefore, values used in the calculations must retain at least <u>eight figures</u>. C)
- 4. To be accurate to the nearest 0.01%, an interest rate greater than 10% must have fourfigure accuracy. Therefore, <u>five figures</u> must be retained in numbers used in the calculations. C)

#### Exercise 1.2

- 1.  $\frac{7}{8} = 0.87500 = 87.500\%$
- 2.  $\frac{65}{104} = 0.62500 = 62.500\%$
- 3.  $\frac{47}{20} = \underline{2.3500} = \underline{235.00\%}$
- $4.-\frac{9}{16} = -0.5625 = -56.25\%$
- 5.  $-\frac{35}{25} = -1.4000 = -140.00\%$
- 6.  $1\frac{7}{25} = \underline{1.2800} = \underline{128.00\%}$
- 7.  $\frac{25}{1000} = 0.025000 = 2.5000\%$
- 8.  $\frac{1000}{25} = 40.000 = 4000.0\%$
- 9.  $2\frac{2}{100} = \underline{2.0200} = \underline{202.00\%}$
- 10.  $-1\frac{11}{32} = -1.3438 = -134.38\%$
- 11.  $\frac{37.5}{50} = 0.75000 = 75.000\%$
- 12.  $\frac{22.5}{-12} = -1.8750 = -187.50\%$
- 13.  $\frac{5}{6} = 0.8\overline{3} = 83.\overline{3}\%$

# Exercise 1.2 (continued)

- 14.  $-\frac{8}{3} = -2.\overline{6} = -266.\overline{6}\%$
- 15.  $7\frac{7}{9} = \underline{7.7} = \underline{777.7\%}$
- 16.  $1\frac{1}{11} = \underline{1.09} = \underline{109.09}\%$

17. 
$$\frac{10}{9} = \underline{11} = \underline{1111}\%$$
  
18.  $\frac{4}{900} = \underline{-0.004} = \underline{-0.4}\%$   
19.  $-\frac{7}{270} = \underline{-0.0259} = \underline{-2.592\%}$   
20.  $\frac{37}{27} = \underline{1370} = \underline{137.037}\%$   
21. 11.3845  $\approx \underline{11.38}$   
22. 9.6455  $\approx \underline{9.646}$   
23. 0.5545454  $\approx \underline{0.5545}$   
24. 1000.49  $\approx \underline{1000}$   
25. 1.0023456  $\approx \underline{1.002}$   
26. 0.030405  $\approx \underline{0.03041}$   
27. 40.09515  $\approx \underline{40.10}$   
28. 0.009099  $\approx \underline{0.009091}$   
29.  $\frac{1}{6} = \underline{0.16667} = \underline{16.667}\%$   
30.  $\frac{7}{6} = \underline{1.1667} = \underline{116.67}\%$   
31.  $\frac{1}{60} = \underline{0.016667} = \underline{16.667}\%$   
32.  $2\frac{5}{9} = \underline{2.5556} = \underline{255.56}\%$   
33.  $\frac{250}{365} = \underline{0.68493} = \underline{68.493}\%$   
34.  $\frac{15}{365} = \underline{0.041096} = \underline{4.1096}\%$   
35.  $\frac{0.11}{12} = \underline{0.0091667} = \underline{0.91667}\%$   
36.  $\frac{0.095}{12} = \underline{0.0079167} = \underline{0.79167}\%$   
37.  $\$92(1 + 0.095 \times \frac{112}{365}) = \$92 \times 1.02915 = \underline{\$94.68}$   
38.  $\$100(1 + 0.11 \times \frac{5}{12}) = \$100 \times 1.04583 = \underline{\$104.58}$   
39.  $\$454.76(1 - 0.105 \times \frac{11}{12}) = \$454.76 \times 0.903750 = \underline{\$410.99}$   
40.  $\frac{\$790.84}{1 + 0.13 \times \frac{311}{365}} = \frac{\$700.84}{1.10767} = \underline{\$711.98}$   
41.  $\frac{\$3490}{1 + 0.125 \times \frac{314}{365}} = \frac{\$3490}{1.031164} = \underline{\$3384.52}$ 

42. 
$$\frac{\$10,000}{1-0.10 \times \frac{182}{365}} = \frac{\$10,000}{0.95013699} = \frac{\$10,524.80}{1000}$$

43. 
$$\$650(1+\frac{0.105}{2})^2 = \$650(1.0525)^2 = \frac{\$720.04}{2}$$

44. 
$$\$950.75(1-\frac{0.095}{4})^2 = \$950.75(0.97625)^2 = \frac{\$906.13}{4}$$

45. 
$$\frac{\$15,400}{(1+\frac{0.13}{12})^6} = \frac{\$15,400}{1.0108333^6} = \frac{\$14,435.88}{1.0108333^6}$$

46. 
$$\frac{4330}{\left(1+\frac{0.115}{2}\right)^4} = \frac{4330}{1.05750^4} = \frac{439.79}{1.05750^4}$$

- 47. =0.<del>33</del> x \$1527 = <u>\$509.00</u>
- 48. 0.0275 x \$2.75 = <u>\$0.08</u>
- 49. 2.50 x \$25 = <u>\$62.50</u>
- 50. 0.00025 x \$200 = <u>\$0.05</u>
- 51. 0.5 x \$30 = <u>\$15.00</u>
- 52. Money available to be spent on entertainment is 100 (53+42) = 5%In dollars, 0.05 x \$14,775 = <u>\$738.75</u> They can spend \$738.75 on entertainment.
- 53. Sales of in-store products = 0.36 x \$102,300 = \$36,828 HST collected on in-store products = 0.13 x \$36,828 = <u>\$4,787.64</u>
- 54. Shots scored from 2-point zone =  $0.545454 \times 33 = 18$ Shots scored from 3-point distance =  $0.46667 \times 15 = 7$ Foul shots scored =  $0.793 \times 29 = 23$ Total points scored =  $18(2) + 7(3) + 23(1) = \underline{80}$

55. 
$$\frac{\$6600(1+0.085\times\frac{153}{365})}{1+0.125\times\frac{82}{365}} = \frac{\$6600(1.035630)}{1.028082} = \underline{\$6648.46}$$
56. 
$$\frac{\$780(1+\frac{0.0825}{2})^5}{(1+\frac{0.10}{12})^8} = \frac{\$780(1.22398)}{1.06864} = \underline{\$893.38}$$
57. 
$$\$1000\left[\frac{(1+\frac{0.09}{12})^7 - 1}{\frac{0.09}{12}}\right] = \$1000\left(\frac{0.05369613}{0.0075}\right) = \underline{\$7159.48}$$
58. 
$$\frac{\$350}{\frac{0.0975}{12}}\left[1 - \frac{1}{(1+\frac{0.0975}{12})^5}\right] = \frac{\$350}{0.008125}(0.0396532) = \underline{\$1708.14}$$
59. 
$$\frac{\$9500}{\frac{(1+\frac{0.075}{4})^5 - 1}{\frac{0.075}{4}}} = \frac{\$9500}{0.01875} = \underline{\$1830.07}$$

$$60. \quad \$45 \frac{\left[1 - \frac{1}{\left(1 + \frac{0.0837}{2}\right)^4}\right]}{\frac{0.0837}{2}} + \frac{\$1000}{\left(1 + \frac{0.0837}{2}\right)^4} = \$45 \left(\frac{1 - \frac{1}{1.178205}}{0.04185}\right) + \frac{\$1000}{1.178205}$$
$$= \$45 \left(\frac{0.151251}{0.04185}\right) + \$848.75$$
$$= \$162.64 + \$848.75$$
$$= \$1011.38$$

- 61. Seats not sold to season-ticket holders = 100% 67.5% = 32.5%Number of seats not sold to season-ticket holders =  $0.325 \times 19289 = 6,269$  seats Rounded to the nearest 100, <u>6300</u> seats were not sold to season-ticket holders.
- 62. Percentage of impurities = 100% 99.95% = 0.05% Amount of impurities = 0.0005 × 31.16 g = 0.01558 g = <u>15.58 mg</u>
- 63. Portion of commission retained =  $0.60 \times 4.8\% = 2.88\%$ Income is 2.88% of sales = $0.0288 \times $5,225,000 = $150,480$ That is, \$150,480 =  $0.0288 \times$ Sales Stan's commission was \$150,480.
- 64. If 18% of \$128,500 is lower than \$23,820 then that will be the contribution.  $0.18 \times 128,500 = \underline{\$23,130}$ Maximum RRSP contribution is  $\underline{\$23,130}$  since it is lower than \$23,820.

#### **Exercise 1.3**

- 1. Regular weekly earnings =  $\frac{\$58,800}{52}$  = \$1130.77 Equivalent hourly rate =  $\frac{\$1130.77}{.35}$  = \$32.31Overtime hourly rate = 1.5(\$32.31) = \$48.47 Gross pay for 39-hour week = \$1130.77 + 4(\$48.47) = \$1324.65 2 Regular biweekly earnings =  $\frac{\$37,500}{26}$  = \$1442.31 Equivalent hourly rate =  $\frac{\$1442.31}{2 \times 37.5}$  = \$19.23 Gross earnings = \$1442.31 + 9(1.5)\$19.23 = <u>\$1701.92</u> 3. Regular biweekly earnings =  $\frac{\$54,600}{26}$  = \$2100.00Equivalent hourly wage =  $\frac{\$2100.00}{2 \times 40}$  = \$26.25 Hasad worked 3 hours of overtime in the first week and 6.5 hours in the second week. Gross pay = \$2100.00 + 9.5(1.5)\$26.25 = \$2474.06 4. Annual earnings = 52(40)\$31.50 = \$65,520
- Equivalent semimonthly earnings =  $\frac{\$65,520}{24} = \frac{\$2730.00}{24}$
- 5. Regular hours worked = 7.5 + 7.5 + 6 + 6 + 7.5 = 34.5Overtime hours worked = 4.5 + 1 + 1.5 = 7Gross earnings = 34.5(\$17.70) + 7(1.5)(\$17.70) = \$796.50

#### Exercise 1.3(continued)

- Total hours worked = 51.5 of which 8 hours were worked on a statutory holiday. Overtime hours worked = 51.5 - (40 + 8) = 3.5Regular earnings = 40(\$34.50)= \$1380.00 = 3.5(1.5) \$34.50 = \$181.13Overtime pay = 8(\$34.50) = \$276.00= 8(2)\$34.50 = \$552.00Holiday pay Holiday premium = 8(2)\$34.50 Gross earnings = <u>\$2389.13</u> 7. Output in excess of quota = 4 + 6 + 7 + 8 + 10 = 35 shirts Total pay = 40(\$7.50) + 35(\$3.00) = \$405.008. Weight packed per day = 7.5(250)(0.500 kg) = 937.5 kg. Earnings per day = 7.5(\$8.25) + (937.5 - 500)(\$0.18) = \$140.639. October earnings = (# renewals)  $\times$  \$20 + (# new policies)  $\times$  \$35 + 0.055(Total premiums) = 126(\$20) + 37(\$35) + 0.055(\$14.375 + \$47.880)= \$7239.03 10. Annual sales = 12(\$11,000) = \$132,000Hillary's earnings = 0.21(\$132,000) + 0.07(\$132,000 - \$100,000) = \$29,96011. Estimated earnings from Supreme Audio &Video = \$2000 + 0.04(\$55,000) = \$4200 Estimated earnings from Buy-Right = \$1500 + 0.03(\$25,000) + 0.06(\$55,000 - \$25,000) = <u>\$4050</u> 12. a. Earnings will be the greater of (0.11) \$600 or 0.11(Sales) = 0.11((5636) = (5619.96)b. The salesman will earn the \$600 from sales if 0.11(Sales) = \$600Sales =  $\frac{600}{011}$  =  $\frac{5454.55}{000}$  per week That is, if 13. Gross earnings = 0.033(\$50,000) + 0.044(\$50,000) + 0.055 (\$40,000) = \$6050.00 14. a. Earnings = \$2000 + 0.022(\$227,000 - \$150,000) = <u>\$3694.00</u> *b.* Average earnings = \$2000 + 0.022(\$235,000 - \$150,000) = <u>\$3870.00</u> For a straight commission rate to generate the same monthly earnings, Commission rate =  $\frac{33870}{235.000} \times 100\% = 1.6468\%$ 15. a. Earnings = 0.05(\$20,000) + 0.075(\$20,000) + 0.10(\$14,880) = \$3988.00b. For the same earnings from a single straight commission rate, Commission rate × \$54,880 = \$3988.00 Commission rate =  $\frac{\$3988}{\$54.880} \times 100\% = \frac{7.267\%}{7.267\%}$ 16. Commission earned = \$630.38 - \$300 = \$330.38 Hence, 0.03(Sales subject to commission) = \$330.38 Sales subject to commission =  $\frac{\$330.38}{0.03}$  = \$11,012.67
  - Total sales = \$11,012.67 + \$20,000 = <u>\$31,012.67</u>

# Exercise 1.3(continued)

17. Commission earned in August = \$3296.97 - \$1500.00 = \$1796.97 Hence,

Commission rate (\$151,342 - \$100,000) = \$51,342

Commission rate = 
$$\frac{\$1796.97}{\$51,342} \times 100\% = \frac{3.50\%}{\$51,342}$$

18. Commission earned on first \$90,000 of sales was0.04(\$40,000) + 0.05(\$50,000) = \$4100

Commission earned on sales in excess of 90,000 was 5350 - 4100 = 1250That is,

0.06(Sales exceeding \$90,000) = \$1250

Sales exceeding 
$$90,000 = \frac{1250}{0.06} = 20,833.33$$

Total sales for the month =  $90,000 + 20,833.33 = \frac{110,833.33}{2}$ 

 Required monthly commission = \$4000 - \$2000 = \$2000 Commission income on first \$50,000 of monthly sales is 0.03(\$50,000 - \$25,000) = \$750

The combined commission and bonus rate on sales exceeding 50,000 is 3% + 3% = 6%. Hence,

Sales exceeding 
$$50,000 = \frac{51250}{0.06} = 20,833.33$$

Required monthly sales =  $\frac{70,833.33}{2}$ 

# **Concept Questions (Section 1.4)**

- 1. You should calculate a weighted average <u>when some of the values being averaged are</u> <u>more important or occur more frequently than other values</u>.
- 2. The weighted average will equal the simple average when the items being averaged all have the same weighting factor. This will happen when each of the values being averaged has the same importance, or occurs the same number of times.
- 3. If you <u>invest the same amount of money in each investment</u>, each rate of return has the same importance. The portfolio's rate of return will then equal the simple average of the individual rates of return.

#### **Exercise 1.4**

1. Weight each number of TV sets per household by the number of homes with that number of TVs. The weighted average number of TVs per household in the survey sample is

$$\frac{(4 \times 4) + (22 \times 3) + (83 \times 2) + (140 \times 1) + (5 \times 0)}{254} = \underline{1.53}$$

Based on the survey, we estimate the average number of TVs per household to be 1.53.

2. The weighted average cost per share is

$$\frac{1000(\$15.63) + 500(\$19.00) + 300(\$21.75)}{1800} = \frac{\$17.59}{1800}$$

3 We should weight each "goals against" figure by the number of games in which that number was scored.

$$GAA = \frac{1(0) + 2(1) + 3(2) + 4(3) + 7(4) + 2(6) + 1(10)}{20} = \underline{3.50}$$

- 4. The amount of sales subject to each commission rate should be used as the weighting factor.
  - a. The average commission rate will be

$$\frac{\$30,000(3\%) + \$20,000(4\%) + \$10,000(6\%)}{\$60,000} = \underline{3.83\%}$$

b. The average commission rate will be:

$$\frac{\$30,000(3\%) + 20,000(4\%) + \$50,000(6\%)}{\$100,000} = \underline{4.70\%}$$

5. The weighted average interest rate that willbe charged on the new \$57,500 balance is  $\frac{37,500(8\%) + 20,000(7\%)}{500(7\%)} = 7.65\%$ 

$$\frac{3(0,0)}{$57,500} = \frac{7.65\%}{}$$

6. The weighted grade point average is

$$\mathsf{GPA} = \frac{5(2.3) + 3(2.7) + 4(3.3) + 2(1.7) + 3(3.0) + 4(2.0)}{5 + 3 + 4 + 2 + 3 + 4} = \frac{53.2}{21} = \frac{2.53}{21}$$

7. Weight each score by the number of students who obtained that score. The weighted average score is

$$\frac{2(10) + 6(9) + 9(8) + 7(7) + 3(6) + 2(5) + 1(3)}{30} = \frac{7.53}{2}$$

8. Weight each semester's GPA by the number of credits on which the respective GPA was obtained. The cumulative GPA is

$$\frac{6(3.5) + 9(3.0) + 12(2.75) + 7.5(3.2)}{6 + 9 + 12 + 7.5} = \frac{105.0}{34.5} = \underline{3.04}$$

9. Note that the age of receivables (rather than the dollar amount of receivables) is to be averaged. The relative importance of each of the three age classifications is determined by the dollar amount in each category. Hence, the weighting factors are the respective dollar amounts of receivables. The (weighted) average age of accounts receivable is

$$\frac{\$12,570(30) + \$6850(60) + \$1325(90)}{\$12,570 + \$6850 + \$1325} = \frac{\$907,350}{\$20,745} = \frac{43.74 \text{ days}}{\$20,745}$$

Exercise 1.4(continued)

10. The rate of return for the entire portfolio is the weighted average return on the five securities in the portfolio. Each rate of return should be weighted by the fraction of the money invested in the respective security. The rate of return on the portfolio is

 $\frac{0.15(14\%) + 0.20(10\%) + 0.10(-13\%) + 0.35(12\%) + 0.20(27\%)}{1.00} = \frac{12.40\%}{1.00}$ 

11. *a*. The weighted average cost of units purchased during the year is 300(\$10.86) + 1000(\$10.47) + 500(\$10.97)

$$\frac{+1000(\$10.47)+500(\$10.97)}{1800} = \frac{\$10.67}{1800}$$

*b.* The weighted average cost of the beginning inventory and units purchased during the year is

 $\frac{156(\$10.55) + 1800(\$10.674)}{1956} = \frac{\$10.66}{1000}$ 

c. Value of ending inventory =  $239 \times$  Weighted average cost = 220(\$10.66)

12. The weighted average price increase was

 $\frac{0.30(10\%) + 0.20(-5\%) + 0.50(15\%)}{1.00} = \underline{9.50\%}$ 

Menu Menu price % of total

13. Eachter and price as af soft cost cost and de weighted by the fraction of revenue obtained from the respect

| Appetizers | 300 | 10 |
|------------|-----|----|
| Entrees    | 200 | 50 |
| Desserts   | 225 | 15 |
| Beverage   | 250 | 25 |

 $\frac{0.10(300\%) + 0.50(200\%) + 0.15(225\%) + 0.25(250\%)}{0.10 + 0.50 + 0.15 + 0.25} = \frac{226.25\%}{0.10 + 0.50 + 0.15 + 0.25}$ On average, Menu prices = 2.2625(Input costs) Therefore, Input costs =  $\frac{\text{Menu prices}}{2.2625}$  = 0.44199(Menu prices) On average, input costs are  $\frac{44.20\%}{0.20\%}$  of revenue.

| 14.   | <u>Period</u> | <u>Balance</u>                 | <u>No. of days</u>   |
|---|---------------|--------------------------------|----------------------|
|   | 1st to 7th    | \$35,000                       | 7                    |
|   | 8th to 24th   | \$35,000 + \$10,000 = \$45,000 | 17                   |
|   | 25th to 31st  | \$45,000 - \$20,000 = \$25,000 | 7                    |
| The weighted average balance on the loan was<br>$\frac{7(\$35,000) + 17(\$45,000) + 7(\$25,000)}{7 + 17 + 7} = \frac{\$38,225.81}{\$38,225.81}$ |               |                                | = <u>\$38,225.81</u> |

# Exercise 1.4(continued)

| 15.  | We want the average number of people   | Devied                      | 1                | Vo. of          | Number of         |
|--|--|-----------------------------|------------------|-----------------|-------------------|
|  | working over the course of the year.   | Period                      | <u>n</u>         | <u>iontns</u>   | <u>empioyees</u>  |
|  | The given figures for the number of  | Jan. 1 to Mar. 3            | 51               | 3               | 14                |
|  | times are used to determine the  | Apr. 1 to Apr. 3            | 0                | 1               | 14 + 7 = 21       |
|  | unites are used to determine the   | May 1 to May 3              | 1                | 1               | 21 + 8 = 29       |
|  | cumulative number of people  | June I to Aug. 3            | 81               | 3               | 29 + 11 = 40      |
|  |  | Sept. 1 to Sept.            | 30               | 1               | 40 - 6 = 34       |
|  | Each number in the third column  | Oct. 1 to Dec. 3            | 51               | 3               | 34 – 14 = 20      |
|  | must be weighted by the number of  |                             |                  |                 |                   |
|  | monuns in the second column. The avera $2(1,4) + 1(24) + 1(20) + 2$  |                             | yeu was          | 5               |                   |
|  | 3(14) + 1(21) + 1(29) + 3  | (40) + 1(34) + 3(20)        | = <u>25.5</u> (  | <u>)</u>        |                   |
|  | 12   |                             |                  |                 |                   |
|  |  |                             |                  | No of           | Cumulative        |
| 16.  | The given figures for the amoun  | t<br>Period                 |                  | months          | investment        |
|  | invested from time to time are used to   | ) Sont 1 to Son             | + 30             | 1               | \$57,000          |
|  | determine the <u>cumulative</u> investment   | Oct 1 to Oct 1              | 1. JU<br>31      | 1               | Ψ37,000<br>72,000 |
|  |  | Nov 1 to Jan                | 31               | 3               | 99,000            |
|  |  | Feb 1 to Feb                | 28               | 1               | 76,000            |
|  |  | Mar. I to Apr. 3            | 30               | 2               | 63,000            |
|  | The (weighted) average investment was  | May 1 to Aug.               | 31               | 4               | 57.000            |
|  | (1(57) + 1(72) + 3(99) + 1(76) + 2(63))  | $\pm 4(57)$ $\times$ \$1000 |                  |                 | - )               |
|  | $\frac{12}{12}$  | =                           | <u>\$71,333</u>  | <u>3.33</u>     |                   |
|  | 12   |                             |                  |                 |                   |
| 17.  | Each number of shares in the   | <b>D</b> <i>i i</i>         | No. of           | Nur             | nber of shares    |
|  | third column must be weighted  | Period                      | <u>months</u>    | <u>outst</u>    | anding (millions) |
|  | by the number of months in the Jan   | . 1 to Feb. 28              | 2                |                 | 5                 |
|  | second column. The (weighted) Mar  | r. 1 to May 31              | 3                |                 | 5 + 1 = 6         |
|  | average number of shares Jun   | e 1 to Oct. 31              | 5                | 6               | 6 + 0.5 = 6.5     |
|  | outstanding was Nov  | /. 1 to Dec. 31             | 2                | 6.5 -           | + 0.75 = 7.25     |
|  | $[2(5)+3(6)+5(6.5)+2(7.25)]\times$   | 1 million                   |                  |                 |                   |
|  | <u>[-(c) + c(c) + c(c) + -(t + c)]</u><br>12   | = 6.25 mi                   | llion = <u>6</u> | <u>,250,000</u> | <u>)</u>          |
|  |  |                             |                  |                 |                   |
| 10   | a. Each cost in the third column must  |                             | Weigh            | nt              |                   |
| 10.  | be weighted by the amount of the   | <u>Ingredient</u>           | <u>(kg)</u>      | <u>Cost</u>     | <u>per Kg</u>     |
|  | ingredient in the Deluxe Nut   | Peanuts                     | 5                |                 | \$2.95            |
|  | Combo. The (weighted) average (  | Cashews                     | 2                |                 | \$9.50            |
|  | cost is  | Almonds                     | 1                |                 | \$11.50           |
|  | ,  | Sunflower seeds             | 0.5              |                 | \$2.75            |
|  | I  | Raisins                     | 0.4              |                 | \$3.60            |
|  | \$   | Smarties                    | 0.3              |                 | \$6.40            |
| 5(2.95) + 2(9.50) + 1(11.50) + 0.5(2.75) + 0.4(3.60) + 0.3(6.40) |  |                             |                  |                 |                   |
| 5 + 2 + 1 + 0.5 + 0.4 + 0.3 = \$5.433/kg                         |  |                             |                  |                 |                   |
| Lien's average cost is \$0.543 per 100 g                         |  |                             |                  |                 |                   |
| b. The retail price is $1.50(\$0.543) - \$0.81$ per 100g         |  |                             |                  |                 |                   |
|  | $x_1 + 10^{-10} x_2 + 100^{-10} x_2 + 100^{-1$ |                             |                  |                 |                   |

#### Exercise 1.5

May

June

| 1. |                |                          | GST Remittance       |
|----|----------------|--------------------------|----------------------|
|    | <u>Quarter</u> | <u>Sales – Purchases</u> | <u>(Refund)</u>      |
|    | 1              | \$155,365                | <u>\$7768.25</u>     |
|    | 2              | (340,305)                | <u>(17,015.25)</u>   |
|    | 3              | 408,648                  | 20,432.40            |
|    | 4              | 164,818                  | <u>8240.90</u>       |
| 2. |                |                          | HST Remittance       |
|    | <u>Month</u>   | <u>Sales – Purchases</u> | <u>(Refund)</u>      |
|    | March          | \$(77,760)               | <u>\$(10,108.80)</u> |
|    | April          | (8255)                   | (1073.15)            |

- 3. The GST charged in each case will be
  - 0.05(\$39,500) = \$1975.00

136,515

114,875

- *a.* With no PST in Alberta, the total amount paid will be \$39,500 + \$1975.00 = \$41,475.00
- *b.* PST in Saskatchewan = 0.05(\$39,500) = \$1975.00 Total amount = \$39,500 + \$1975.00 + \$1975.00 = <u>\$43,450.00</u>
- *c.* PST in Quebec = 0.09975(\$39,500) = \$3940.13 Total amount = \$39,500 + \$1975.00 + \$3940.13= <u>\$</u>45,415.13
- 4. Cost in Manitoba = \$1000 + GST + PST = \$1000 + 0.05(\$1000) + 0.08(\$1000) = \$1130.00 Cost in PEI = \$1000 + HST = \$1000 + 0.14(\$1000) = \$1000 + \$140 = \$1140.00 The consumer will pay \$1140.00 -\$1130.00 = \$10.00 more in PEI.

17.746.95

The consumer will pay \$1140.00 – \$1150.00 =  $\frac{510.00}{1000}$  more in PEI.

- 5. *a.* The HST reported for a \$39.45 (pre-tax) item is 0.13(\$39.45) = <u>\$5.13</u>.
  - *b.* The HST inclusive price is \$39.45 + \$5.13 = \$44.58. If \$50 cash is paid, change will be based on the rounded price of \$44.60. Therefore, change will be \$50 \$44.60 = <u>\$5.40</u>.
- The HST rate in New Brunswick is 13%. For each \$100 of pre-tax price, the tax-inclusive price must include HST of \$13. That is, a tax-inclusive price is \$113includes \$13 of HST. The HST is, therefore,

$$\frac{\$13}{\$113} \times 100\% = 11.50\% \text{ of the HST-inclusive price}$$

Consequently, a \$495 tax-inclusive price includes HST =  $0.1150 \times $495 = \frac{$56.93}{2}$ 

- 7. Property tax =  $\frac{\text{Mill rate}}{1000} \times \text{Assessed value} = \frac{16.8629}{1000} \times \$227,000 = \frac{\$3827.88}{2227}$
- 8. a. 0.1 mill = \$0.10 per \$1000 of assessed value = <u>\$0.01 per \$100</u> of assessed value
  - *b.* Property tax increase =  $\frac{0.1}{1000} \times \$200,000 = \underline{\$20.00}$

#### Exercise 1.5(continued)

9. Total taxes = 
$$\frac{15.0294}{1000} \times \$143,000 + \frac{4.6423}{1000} \times \$467,000$$
  
=  $\$2149.204 + \$2167.954$   
=  $\frac{\$4317.16}{\$100}$   
10. *a*. Current year's taxes =  $\frac{\$1.52193}{\$100} \times \$298,000 = \$4535.35$   
Previous year's taxes =  $\frac{\$1.56324}{\$100} \times \$285,000 = \$4455.23$   
Change in property taxes =  $\frac{\$80.12 \text{ increase}}{\$100}$   
*b*. For the current year's taxes to remain at \$4455.23,  
 $\frac{\text{New tax rate}}{\$100} \times \$298,000 = \$4455.23$   
New tax rate =  $\frac{\$4455.23}{\$298,000} \times \$100 = \frac{\$1.49504 \text{ per }\$100}{\$100}$  of assessed value

11. *a.* Tax increase = 
$$\frac{\text{Mill rate increase}}{1000} \times \text{Assessed value}$$
$$\$2,430,000 = \frac{\text{Mill rate increase}}{1000} \times \$6,780,000,000$$
$$\text{Mill rate increase} = \frac{\$2430}{\$6,780,000} \times 1000 = 0.3584$$
$$\text{Next year's mill rate} = 7.1253 + 0.3584 = \underline{7.4837}$$

*b.* Next year's assessment = 1.05(\$6.78 billion) = \$7.119 billion Next year's budget = Current year's taxes + \$2,430,000

$$= \frac{7.1253}{1000} \times \$6.78 \text{ billion} + \$2,430,000$$
$$= \$50,739,534$$

Next year's school mill rate applied to next year's assessment must generate enough tax revenue to meet next year's budget. That is,

$$\$50,739,500 = \frac{\text{New mill rate}}{1000} \times \$7.119 \text{ billion}$$
  
New mill rate =  $\frac{\$50,739,500}{\$7,119,000} = \underline{7.1273}$ 

12. Current budget = Last year's budget + \$750,000

$$= \frac{\$0.94181}{\$100} \times \$1.563 \text{ billion} + \$750,000$$
$$= \$15,470,490.3$$

Current assessment = \$1563 million + \$97 million = \$1660 million

Hence,  $\$15,470,490 = \frac{\text{New tax rate}}{\$100} \times \$1660 \text{ million}$ 

New tax rate = 
$$\frac{\$15,470,490 \times \$100}{\$1,660,000} = \frac{\$0.93196}{\$1.990}$$

That is, the tax rate would have to be <u>\$0.93196 per \$100</u> of assessed value.

#### **Review Problems**

1. a. 
$$(2^{3} - 3)^{2} - 20 \div (2 + 2^{3}) = (8 - 3)^{2} - 20 \div (2 + 8) = 25 - 20 \div 10 = 25 - 2 = 23
b.  $4(2 \times 3^{2} - 2^{3})^{2} \div (10 - 4 \times 5) = 4(2 \times 9 - 8)^{2} \div (10 - 20)$   
 $= 4 \times 10^{2} \div (-10)$   
 $= \underline{-40}$   
c.  $\$213.85(1 - 0.095 \times \frac{5}{12}) = \$213.85(1 - 0.039583) = \underline{\$205.39}$   
d.  $\frac{\$2315}{1 + 0.0825 \times \frac{77}{365}} = \frac{\$2315}{1.0174041} = \underline{\$2275.40}$   
e.  $\$325.75(1 + \frac{0.105}{4})^{2} = \$325.75(1.053189) = \underline{\$343.08}$   
f.  $\frac{\$710}{(1 + \frac{0.0925}{2})^{3}} = \frac{\$710}{1.145266} = \underline{\$619.94}$   
g.  $\$885.75(1 + 0.0775 \times \frac{231}{365}) - \frac{\$476.50}{1 + 0.0775 \times \frac{49}{365}} = \$885.75(1.049048) - \frac{\$476.50}{1.010404}$   
 $= \$929.194 - \$471.593$   
 $= \underline{\$457.60}$   
h.  $\$859(1 + \frac{0.0825}{12})^{3} + \frac{\$682}{(1 + \frac{0.0825}{12})^{2}} = \$859(1.020767) + \frac{\$682}{1.013797}$$$

$$\frac{1}{12} + \frac{1}{(1 + \frac{0.0825}{12})^2} = \$859(1.020787) + \frac{1}{1.013797}$$
$$= \$876.839 + \$672.718$$
$$= \$1549.56$$

2. a. 
$$96 - (6 - 4^2) \times 7 - 2 = 96 - (-10)7 - 2 = \underline{164}$$
  
b.  $81 \div (5^2 - 16) - 4 (2^3 - 13) = 81 \div 9 - 4(-5) = \underline{29}$   
c.  $\frac{\$827.69}{1 + 0.125 \times \frac{273}{365}} + \$531.49 (1 + 0.125 \times \frac{41}{365}) = \frac{\$827.69}{1.093493} + \$531.49(1.014041)$   
 $= \$756.923 + \$538.953$ 

$$d. \quad \$550.45 \left( 1 + 0.0875 \times \frac{195}{365} \right) - \frac{\$376.29}{1 + 0.0875 \times \frac{99}{365}} = \$550.45 (1.046747) - \frac{\$376.29}{1.023733} = \frac{\$208.62}{1.023733}$$

e. 
$$\$1137 \left(1 + \frac{0.0975}{12}\right)^2 + \frac{\$2643}{\left(1 + \frac{0.0975}{12}\right)^3} = \$1137(1.016316) + \frac{\$2643}{1.024574} = \frac{\$3735.16}{1.024574}$$

3. 0.62 x 99 = <u>\$61.38</u>

# **Review Problems** (continued)

- 4. 0.80 x<u>\$156.25 = \$125.00</u>
- 5. 0.0075 x\$ 133.33 = <u>\$1.00</u>
- 6. Two hours = 2(60) = 120 minutes 0.125 x 120 = <u>15 minutes</u>
- 7. Actual profit =  $0.90 \times 23,400 = 21,060.00$
- Price increase = 0.35×\$2.20 = \$0.77 Selling price = \$2.20 + \$0.77 = <u>\$2.97</u> per share
- 9. *a.* Gross biweekly earnings =  $\frac{\$56,600}{26}$  = \$2176.92Equivalent hourly wage =  $\frac{\$2176.92}{2 \times 37.5}$  =  $\frac{\$29.03}{2}$ 
  - b. Total remuneration = \$2176.92 + 4.5(1.5)\$29.03 = \$2372.87
- 10. Gross biweekly earnings =  $\frac{\$61,000}{26}$  = \$2346.15 Equivalent hourly rate =  $\frac{\$2346.15}{75}$  = \$31.28 Gross pay = \$2346.15 + 33(1.5)\$31.28 =  $\frac{\$3894.51}{51}$
- 11. Total hours worked = 41 hours Overtime hours worked = 1.5 (on Wednesday)+ 0.5 (on Friday) = 2 hours Regular hours worked = 41 - 2 (hrs of overtime) - 3 (hrs on stat holiday) = 36 hours Regular earnings = 36(\$42.50) = \$1530.00Overtime pay = 2(1.5)\$42.50 = \$127.50Holiday pay = 7.5(\$42.50) = \$318.75Holiday premium = 3(2)\$42.50 = \$255.00Gross earnings = \$2231.25
- 12. Gross earnings = 1000 + 0.08(10,000) + 0.10(38,670 30,000) =
- 13. Commission earnings = Commission rate (Sales \$40,000) 3188.35 - 1000 =Commission rate (\$88,630 - \$40,000) Commission rate =  $\frac{$2188.35}{$48.630} \times 100\% = \frac{4.50\%}{$48.630}$

#### **Business Mathematics in Canada 8th Edition Jerome Solutions Manual**

Full Download: https://alibabadownload.com/product/business-mathematics-in-canada-8th-edition-jerome-solutions-manual/

# Review Problems (continued)

14. a. Commission = Commission rate x Base  
= 0.04(\$200,000) + 0.025(\$89,000)  
= \$8000 + \$2225  
= \$10,225.00  
b. Average commission rate = 
$$\frac{\text{Total commission}}{\text{Selling price}} \times 100\% = \frac{$10,225}{$224,184232,000} \times 100\% = 3.54\%$$
  
15. Average change in revenue for the year =  $\frac{22}{$24,184232,28}$   
=  $\frac{-198\%}{100}$  =  $\frac{-1,98\%}{100}$  =  $\frac{-1,98\%}{2,244,18422,28}$   
=  $\frac{-198\%}{100}$  =  $\frac{-1,98\%}{100}$   
16. Rate of return on the portfolio = Weighted average rate of return  
=  $\frac{$16,800(-4.3\%) + $25,600(-1.1\%) + $31,000(8.2\%)}{$16,800 + $25,600(-1.1\%) + $31,000(8.2\%)}$   
=  $\frac{2.10\%}{$16,800 + $25,600(-1.1\%) + $31,000(8.2\%)}$   
=  $\frac{2.10\%}{$5000(30\%) + 20,000(-3\%) + $8000(-15\%) + $25,000(13\%) + $4500(45\%)}{$5000 + $20,000 + $20,000 + $25,000 + $4500}$   
=  $\frac{7.96\%}{$5000 + $20,000 + $20,000 + $20,000 + $4500}$   
=  $\frac{7.96\%}{$5000 + $20,000 + $20,000 + $23,000 = $60,400}$   
Apr. 1 to July 31 4 \$82,200 - \$21,800 = \$80,400  
Aug. 1 to Odr. 31 2 \$84,100 + \$19,300 = \$103,400}  
Average investment during the year  
=  $\frac{2($96,400) + 1($82,200) + 4($60,400) + 3($84,100) + 2($103,400)}{12}$   
=  $\frac{$81,308,33}{$19. No. of $Number of $10,300 $10,31 $2 $7 + 6 = 13$
Nov. 1 to Nov. 30 1 $1 $1 $4 $18 $31$
Dec. 1 to Feb. 28 3 $3 $1 + 23 $54$
Mar. 1 to Mar. 31 $1 $2 $7 + 6 = 13$
Nov. 1 to Nov. 30 $1 $1 $4 $2 $20 $23,700 $24,100,400}$   
Average investment during the year  
=  $\frac{2($96,400) + 1($82,200) + 4($60,400) + 3($84,100) + 2($103,400)}{12}$   
=  $\frac{$81,308,33}{$19. No. of $Number of $12 $2 $54$
Mar. 1 to Mar. 31 $1 $2 $7 + 6 = 13$
Nov. 1 to Nov. 30 $1 $1 $3 $1 $2 $7 + 6 = 13$
Nov. 1 to Nov. 30 $1 $1 $3 $1 $2 $2 $3 $1 $4 $2 $20 $23 $10 $4 $400$
Average investment during the year
 $\frac{2($96,400 + 1($32,200) + 4($60,400) + 3($84,100) + 2($103,400)}{12}$   
=  $\frac{$81,308,33}{$19. No. of $Number of $10 = 10$
Mar. 1 to Mar. 31 $1 $2 $7 + 6 = 13$
Nov. 1 to Nov. 30 $1 $1 $3 + 18 = 31$
Dec. 1 to Feb. 28 $3 $3 $1 + 23 = 54$
Mar. 1 to Mar. 31 $1 $2 $7 $7 $3 $2 $2 $3 $1 $6 $7$
The (weighted) average number of employees was
 $\frac{4(7) +$$$