

CHAPTER 1

Consumer arithmetic



EXCEL YEARS 9 & 10 ADVANCED MATHS
Ch. 1, 1.1, p. 1

UNIT 1: Earning and saving money

QUESTION 1

a Michelle works for 40 hours per week and is paid \$12.80 per hour. Find her weekly wage.

b John works for 37 hours in a week and his weekly wage is \$582.75. Find his hourly rate of pay.

QUESTION 2

a Brent's normal wage is \$672 for a 40-hour week. He worked overtime and earned \$873.60 in one week.

i Find his normal hourly rate.

ii How much extra did he get for overtime?

iii How many hours of overtime did he work if he was paid double time for the overtime worked

b Sarah works for the Department of Taxation on an annual salary of \$65 520. If she receives $17\frac{1}{2}\%$ holiday loading on the four weeks holiday pay period, calculate:

i her normal pay for four weeks.

ii her holiday loading.

iii her holiday pay for the four weeks.

iv If she saves 30% of her total holiday pay for four weeks, how much is her savings?

c Louise works as a dentist in a dental hospital and her yearly salary is \$68 000. Her fortnightly deductions include income tax \$960, medicare levy \$40 and union fee \$5.50. Calculate her fortnightly take-home pay (net pay).



UNIT 2: Simple interest

QUESTION 1 Find the simple interest on:

\$7800 at 12% p.a. for 3 years.

\$12 500 at 15% p.a. for 6 months.

\$1000 for 50 days at 20% p.a.

\$5000 for 5 months at 0.8% per month.

\$60 000 for 20 days at $5\frac{1}{2}\%$ p.a.

b \$6500 at 4% p.a. for 2 years.

d \$13 000 at 16% p.a. for 7 months.

f \$20 000 for 25 days at 15% p.a.

h \$7000 for 3 months at 0.6% per month.

j \$80 000 for 35 days at $6\frac{3}{4}\%$ p.a.

QUESTION 2

Find the interest rate if a principal of \$2500 yields interest of \$625 in 2 years.

An investment yielded \$4500 interest in 4 years at 9% p.a. Find the principal invested.

\$8500 was invested at 15% p.a. Find the number of years the money was invested if the total interest earned was \$3825.



UNIT 3: Compound interest

QUESTION 1 Find the compound interest earned on the following investments.

a \$5000 for 5 years at 5% p.a.

b \$8500 for 6 years at 12% p.a.

c \$12 000 for 2 years at 8% p.a.

d \$55 000 is invested for 3 years at 9% p.a.

e \$3650 for 5 years at 6.5% p.a.

f \$32 000 for 3 years at 7.25% p.a.

QUESTION 2 Calculate the total amount when:

a \$49 000 is invested at 12% p.a. for 5 years if the interest is compounded monthly.

b \$30 000 is invested at 18% p.a. for 7 years if the interest is compounded quarterly.

c \$8 000 is invested at 10% p.a. for 3 years if the interest is compounded six-monthly.

d \$10 000 is invested at 15% p.a. for 6 years if the interest is compounded monthly.



UNIT 4: Depreciation

QUESTION 1 Find the value of the following items after the given time.

Car: Cost price \$35 000; rate of depreciation 15% p.a.; time 7 years.

Furniture: Cost price \$20 000; rate of depreciation 12% p.a.; time 3 years.

Television: Cost price \$5 000; rate of depreciation 8% p.a.; time 4 years.

Computer: Cost price \$3 000; rate of depreciation 10% p.a.; time 2 years.

QUESTION 2

A business buys new machinery for \$80 000 that depreciates at the rate of 20% p.a. Calculate:

- i its value after 3 years. ii the amount of depreciation.

A truck depreciates in value by 20% every year. If its original value is \$46 000, find its value after 4 years.

Use the depreciation formula $A = P\left(1 - \frac{r}{100}\right)^n$ to find the original value of a car if its value after 5 years depreciating at the rate of 10% is \$48 000.

A table lamp costing \$1500 when new depreciates at the rate of 20% p.a. After how many years will its value be approximately \$300?



UNIT 5: Interest, depreciation and problems

QUESTION 1

- a Find the simple interest on \$10 000 at $9\frac{1}{2}\%$ p.a. for 3 years.
-
-
- b Calculate the principal to be invested at 8% p.a. for 5 years to earn an interest of \$4800.
-
-
- c At what rate should \$15 000 be invested to earn an interest of \$3600 in 3 years?
-
-
- d Calculate the total amount when \$60 000 is invested at $9\frac{1}{2}\%$ p.a. for 4 years if the interest is compounded yearly.
-
-
- e At the start of 1995 a town had a population of 12 000. Since then the population has increased annually by 5% of the existing population. Find its population at the start of the year 2000.
-
-
- f An airline company bought a jet for \$5 000 000. If it depreciates at the rate of 15% per year, what will be its value after 6 years?
-
-
- g An industrial firm has machinery of the value of \$800 000. Its value depreciates at the rate of 20% per year. What will be its value at the end of 6 years?
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UNIT 6: Borrowing money

QUESTION 1 Nelly wanted to buy a car and approached a bank for a personal loan of \$20 000. The manager approved the loan at an interest rate of 8% p.a. She has to repay the loan in 5 years.

a What interest will Nelly pay during that period?

b What will be her monthly repayment?

QUESTION 2 Michael decided to buy a TV marked at \$3000. He pays 20% deposit and the balance over 3 years, with interest charged at 15% on the balance.

a Find the deposit paid.

b Calculate the balance owing.

c Calculate the interest paid.

d Find the total amount to be repaid.

e What is the monthly repayment?

QUESTION 3 Chris wants to buy a boat and takes out a loan of \$10 000 on which the interest rate charged is 9.5% flat. There is also a loan protection fee of 30 cents for each \$100 borrowed. The loan is repaid over 5 years in equal monthly instalments.

a Calculate the total amount repaid.

b Find the amount of each monthly repayment.

c Given the formula $E = \frac{2Rn}{n+1}$, where $R\%$ is the flat rate of interest and n is the total number of equal monthly instalments, calculate the effective interest rate $E\%$ on this loan.



UNIT 7: Home loans

QUESTION 1 Andrew buys a house for \$300 000. He borrows 80% of the purchase price from a building society which charges 13.5% p.a. on the amount owing.

a Find the deposit paid.

b What is the amount of interest charged per year on the balance owing?

c If \$2900 is paid per month, how much of the balance is paid during the first year (assume simple interest)?

QUESTION 2 Yvette buys a house for \$190 000, pays a deposit of \$50 000, and then pays off the balance at \$850 per month for 25 years. Find:

a the total cost of the house.

b the yearly interest paid.

QUESTION 3 Kate buys a block of land for \$150 000. She pays a deposit of \$30 000 and borrows the remainder from a bank. The repayments are \$1350 per calendar month. The loan is repaid after 10 years. In addition, she paid in cash the following charges; government and other charges = \$3000, solicitor's fees = \$1345.

a Calculate the amount repaid to the bank.

b Find the total cost of purchasing the land.

c Find the amount paid in excess of \$150 000. Express this amount as a percentage of the purchase price.

Consumer arithmetic

Instructions for SECTION 1

- You have 15 minutes to answer Section 1
- Each question is worth 2 marks
- Attempt ALL questions
- Calculators are NOT to be used
- Fill in only ONE CIRCLE for each question

| | | | | Marks | | |
|-----------|---|--------------|--------------|-----------------|-----------------|---|
| 1 | 6% of an amount is \$300. The amount is | (A) \$18 | (B) \$50 | (C) \$1800 | (D) \$5000 | 2 |
| 2 | $\frac{4}{5}$ of \$7.75 equals | (A) \$1.55 | (B) \$6.02 | (C) \$6.20 | (D) \$31.00 | 2 |
| 3 | 300% of 5 is | (A) 15 | (B) 10 | (C) $\sqrt{10}$ | (D) $2\sqrt{5}$ | 2 |
| 4 | 40 empty cans weigh 1 kg and are sold for 25 cents. How many cans can be sold for \$100? | (A) 8000 | (B) 12 000 | (C) 16 000 | (D) 20 000 | 2 |
| 5 | One Australian dollar is equal to 210 Japanese yen. How many dollars are equal to 1700 yen? | (A) 12 cents | (B) \$80.95 | (C) \$8.10 | (D) \$12.35 | 2 |
| 6 | \$500 invested for 2 years at 10% simple interest p.a. becomes | (A) \$550 | (B) \$600 | (C) \$625 | (D) \$650 | 2 |
| 7 | A dealer sells an article for \$25 and makes a profit of \$5. His percentage profit is | (A) 15% | (B) 20% | (C) 25% | (D) 30% | 2 |
| 8 | \$2000 invested for 2 years at 10% compound interest becomes | (A) \$2400 | (B) \$2420 | (C) \$2666 | (D) \$5000 | 2 |
| 9 | A debt of \$542.40 is to be paid in equal instalments of \$45.20. How many instalments are needed? | (A) 8 | (B) 10 | (C) 12 | (D) 14 | 2 |
| 10 | Kate is paid \$9.50 per hour for the first 36 hours and is paid time-and-a-half for every extra hour worked. How much is she paid for 41 hours? | (A) \$389.50 | (B) \$413.25 | (C) \$460.75 | (D) \$584.25 | 2 |

Total marks achieved for SECTION 1

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|----|
| 20 |
|----|

Consumer arithmetic

- Instructions for SECTION 2**
- You have 20 minutes to answer ALL of Section 2
 - Each question is worth 2 marks
 - Attempt ALL questions
 - Calculators may be used

| Questions | Answers | Marks |
|--|---------|-------|
| 1 Find John's weekly wage if he works for 38 hours at the rate of \$15.60 per hour. | _____ | 2 |
| 2 Find the simple interest on \$8000 at 8% p.a. for 3 years. | _____ | 2 |
| 3 Find the rate per cent if a principal of \$4000 yields interest of \$960 in 3 years. | _____ | 2 |
| 4 Find the compound interest on \$6000 for 6 years at 6% p.a. | _____ | 2 |
| 5 Find the total amount when \$53 000 is invested at 9% p.a. for 5 years if the interest is compounded quarterly. | _____ | 2 |
| 6 A T.V. costs \$5000 and depreciates at the rate of 18% p.a. Find its value after 5 years. | _____ | 2 |
| 7 A new machine that costs \$15 000 depreciates at the rate of 20% p.a. Calculate its value after 3 years. | _____ | 2 |
| 8 At what rate should \$5600 be invested to earn an interest of \$1176 in 3 years? | _____ | 2 |
| 9 A landlord charges an annual rent of \$13 920. Find the monthly rent. | _____ | 2 |
| 10 The annual salary of a person is \$54 600. Find his weekly income. | _____ | 2 |
| 11 An article marked \$175 was sold for \$125. What was the percentage discount? | _____ | 2 |
| 12 What is the simple interest on \$2500 at 6% p.a. for 7 months? | _____ | 2 |
| 13 Which is the best buy: 1 kg for \$3.60, 500 g for \$2.10, 300 g for 89 cents or 750 g for \$2.30? | _____ | 2 |
| 14 An article costing \$60 is sold at a loss of 20% of the cost price. Find the selling price. | _____ | 2 |
| 15 A credit card company charges 0.05753% interest per day. Find the interest charged in 4 weeks on a balance of \$900. | _____ | 2 |

Total marks achieved for SECTION 2

| |
|----|
| 30 |
|----|

Answers

- PAGE 1** 1 a \$512 b \$15.75 2 a i \$16.80 ii \$201.60 iii 6 hours b i \$5040 ii \$882 iii \$5922 iv \$1776.60 c \$1609.88
- PAGE 2** 1 a \$2808 b \$520 c \$937.50 d \$1213.33 e \$164.38 f \$205.48 g \$200 h \$126 i \$180.82 j \$517.81 2 a 12.5%
b \$12 500 c 3 years
- PAGE 3** 1 a \$1381.41 b \$8277.49 c \$1996.80 d \$16 226.60 e \$1350.82 f \$7476.79 2 a \$89 018.14 b \$102 891 c \$10 720.77
d \$24 459.20
- PAGE 4** 1 a \$11 220.20 b \$13 629.44 c \$3581.96 d \$2430 2 a i \$40 960 ii \$39 040 b \$18 841.60 c \$81 288.42 d 7 years
- PAGE 5** 1 a \$2850 b \$12 000 c 8% p.a. d \$86 259.66 e \$15 315 f \$1 885 748 g \$209 715.20
- PAGE 6** 1 a \$8000 b \$466.67 2 a \$600 b \$2400 c \$1080 d \$3480 e \$96.67 3 a \$14 780 b \$246.33 c 18.9%
- PAGE 7** 1 a \$60 000 b \$32 400 c \$2400 2 a \$305 000 b \$4600 3 a \$162 000 b \$196 345 c \$46 345, 23.6%
- PAGE 8** 1 D 2 C 3 A 4 C 5 C 6 B 7 C 8 B 9 C 10 B
- PAGE 9** 1 \$592.80 2 \$1920 3 8% p.a. 4 \$2511.11 5 \$82 706.99 6 \$1853.70 7 \$7680 8 7% p.a. 9 \$1160 10 \$1050 11 28.57%
12 \$87.50 13 300 g for 89 cents 14 \$48 15 \$14.50