

Year 10 Term 1 Homework

Student Name: _____	Grade: _____
Date: _____	Score: _____

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2 Year 10 Term 1 Week 2 Homework

2.1 Consumer Arithmetic

2.1.1 Loans

- Loan is an amount of money that is borrowed from bank or finance company.
- Interest on loan is usually charged as reducible interest.
- The borrower repays the loan and interest by making regular payments called instalments.
- Home loans can be taken out at variable rates of a fixed rate.

Exercise 2.1.1 The table shows the monthly payments required to repay a loan of \$1000 over periods of 10 to 30 years. A couple borrowed \$380,000 from a bank to buy a house. The bank charged reducible interest on the loan at the rate of 5.75% p.a monthly. The borrowers agreed to repay the load and interest over a period of 30 years.

Interest rate p.a.	10 years	15 years	20 years	25 years	30 years
5%	10.61	7.91	6.60	5.85	5.37
5.25%	10.73	8.04	6.74	5.99	5.52
5.5%	10.85	8.17	6.88	6.14	5.68
5.75%	10.98	8.30	7.02	6.29	5.84
6%	11.10	8.44	7.16	6.44	6.00

1. What is the monthly repayments?

2. How much will they repay altogether on this loan?

3. How much interest will they pay?

4. Calculate the equivalent flat yearly interest rate, correct to 1 decimal place.

Exercise 2.1.2 The table below shows the monthly repayment required to repay each \$1000 of housing loan at various monthly reducible rates of interest.

Interest rate p.a.	10 years	15 years	20 years	25 years	30 years
4.5%	10.36	7.65	6.33	5.56	5.07
4.75%	10.48	7.78	6.46	5.70	5.22
5%	10.61	7.91	6.60	5.85	5.37
5.25%	10.73	8.04	6.74	5.99	5.52
5.5%	10.85	8.17	6.88	6.14	5.68
5.75%	10.98	8.30	7.02	6.29	5.84
6%	11.10	8.44	7.16	6.44	6.00
6.25%	11.23	8.57	7.31	6.60	6.16
6.5%	11.35	8.71	7.46	6.75	6.32

1. John borrows \$200,000 to buy a house. The bank charges 5.25% p.a. monthly reducible interest and the term of the loan is 15 years.

(a) What are John's monthly repayments?

(b) How much will he repay altogether on this loan?

(c) How much interest will he pay?

(d) Express the interest charged as a percentage of the amount borrowed.

2. William borrowed \$185,000 at 5.25% p.a. monthly reducible interest to buy a unit. How much money would William save if he paid off the loan over 15 years instead of over 20 years?

2.1.2 Buying major items

There are many ways by which major items can be purchased:

- **Cash:** Goods are paid for and received immediately.
- **Lay-by:** A deposit is paid up-front, and the balance of the purchase price is paid instalments over a period of time. The goods are not received until the entire purchase price is paid off. Interest is not charged on lay-by purchases.
- **On terms:** A deposit is paid up-front and the balance is paid regular instalments over a period of time. The good are received immediately. Interest is usually charged in the balance owing and is included in each of the instalments.
- **Deferred payment:** A deposit is usually required . The goods can then be taken , which the balance to be paid before some agreed time in the future. Interest is paid if the balance is not paid on time.
- **Credit card:** The card has a set credit limit. An interest-free period may be available. Goods can be taken immediately when purchased by a credit card.
- **Loans:** Money is borrowed from a financial institution. Interest is charged on the outstanding debt, which must be paid off by regular instalments.

Exercise 2.1.3 Sam bought a new car valued at \$24,000. He paid a deposit of 20%, followed by equal monthly payments of \$640 over 4 years.

1. Find the deposit and the balance owing.

2. Calculate the total amount that Sam paid for the car.

3. How much interest did he pay?

4. What is the annual interest rate that Sam was charged?

Exercise 2.1.4

1. A watch is priced for sale at \$280. The watch is discounted by 15% during the mid-year sale, and a customer is given a further 5% discount for paying by cash. Find the purchase price of the watch. (Hint: consecutive discount)

2. A car is advertised for sale at \$17,990. A customer wants to purchase the car on the terms and is given a choice of two payment plans:
Plan A: a deposit of \$3500 and equal monthly payments of \$450 for 4 years, or
Plan B: a deposit of 20% and equal monthly payments of \$350 over 5 years.
Which is the cheaper payment plan, and by how much?

3. A man was quoted \$5600 for the construction of a garage at the front of his house. He decided to pay for the construction on terms by paying equal monthly instalments of \$294 for 2 years.

(a) How much did he pay for the construction of the garage?

(b) How much interest did he pay?

(c) Find the annual interest rate that was charged.

Exercise 2.1.5 Further applications

1. A Smart-TV was advertised for sale at \$4,500. A customer decided to purchase the TV on terms by paying a deposit of 15%, which interest charged on the balance at 12% p.a. over 3 years.

(a) Calculate the size of the deposit.

(b) Find the balance owing after the deposit has been paid.

(c) Calculate the interest on the balance.

(d) How much will the customer pay altogether in monthly instalments?

(e) Find the amount of each monthly instalment.

2. A car with a sale price of \$23,990 was purchased on the following terms: a deposit of 20% with equal monthly instalments of \$632 over 5 years. Find the annual interest rate charged, correct to 1 decimal place.

2.1.3 Credit cards

- Credit cards are issued by financial institutions.
- High rates of interest are usually charged.
- An interest-free period may be available.

Exercise 2.1.6

1. Calculate the amount of simple interest that is payable on each of these credit card debts.

- (a) \$800 for 10 days at 0.06% per day. _____
- (b) \$392 for 45 days at 0.05225% per day. _____
- (c) \$1260 for 15 days at 20.25% p.a. _____
- (d) \$3725 for 45 days at 23.75% p.a. _____

2. Jessica has a credit card with no annual fee. Interest is charged at 15.33% p.a. on all purchases at a daily rate, from the date of purchase.

(a) Calculate the equivalent daily rate of interest.

(b) Jessica used her credit card in 17 June to pay for her car registration. The cost of registering the car was \$318. She paid the credit card account on 8 July. How many days was she charged interest?

(c) How much did she pay altogether, including the interest charge?

Exercise 2.1.7

1. Tom bought a business suit at \$120 on 5 July, using his credit card which has not interest free period. He paid this off on 27 July and was charged interest at the rate of 0.05644% per day from the date of purchase. How much interest did he pay on this purchase?

2. Emma's credit card comes with 55 days interest-free period. Interest charged on the balance outstanding after this period at an interest rate of 14% p.a. Emma used her credit card to pay for her holiday to Fiji Island, which cost \$2520. She repaid \$900 of this amount within the interest-free period and the balance after 75 days. How much interest will she pay?

3. Tracy has a credit limit of \$2500 on her credit card. If she exceeds this limit at any time, the card company charge an extra fee of \$25 plus 0.0584% per day on the amount owing above her credit limit. On 16 May, Tracy has a credit card debt of \$2370. The following day, she used the card to pay her car insurance of \$560.

(a) Has she exceeded her credit limit? If so, by how much?

(b) If she pays this amount 7 days later calculate the extra fee that she will be charged.

2.2 Miscellaneous exercises

Exercise 2.2.1 Solve the following quadratic equations:

1. $x^2 + x = 12$

2. $(2x - 1)(3x + 5) = 0$

3. $6x^2 = 5x + 6$

4. $2x^2 - x = 15$

5. $2x^2 = 11x - 5$

Exercise 2.2.2 Solve the quadratic equations by completing the square.

1. $x^2 + 4x + 1 = 0$

2. $2x^2 - 4x - 1 = 0$

3. $x^2 - 3x - 5 = 0$

Exercise 2.2.3 Solve the quadratic equations by completing the square.

1. $2x^2 - 8x + 1 = 0$

2. $3x^2 + 2x - 3 = 0$

3. $4x^2 - x - 2 = 0$

4. $2x^2 + 9x + 4 = 0$

Exercise 2.2.4 Simplify the following:

1. $x^{-1} \times 2x^{\frac{1}{2}}$

2. $(5x^{\frac{1}{4}})^2 \div (125x^3)^{\frac{1}{3}}$

3. $81^{2x-1} \div 243^{x-2}$

4. $\frac{x^{-1}+y^{-1}}{x+y} - \frac{x^{-1}-y^{-1}}{x-y}$
