Interest and
depreciation
crossword

This chapter, Interest and depreciation, examined the mathematics of calculating interest and depreciation. You have applied percentage increase and decrease in various contexts and also calculated simple interest and compound interest in a variety of situations involving investments. Digital technology and graphs have been used to compare simple interest and compound interest graphs for different rates and periods. Depreciation of assets has been calculated using the straight-line method.

Make a summary of this topic. Use the outline at the start of this chapter as a guide. An incomplete mind map is shown below. Use your own words, symbols, diagrams, boxes and reminders. Gain a 'whole picture' view of the topic and identify any weak areas.
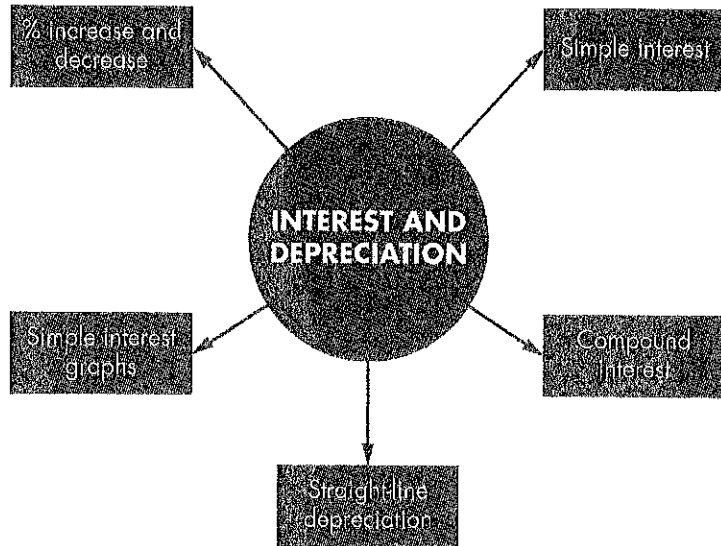
1 Rami, a marketing manager, earns $72 000 per annum. If her salary is increased by 6.4%, calculate her new salary.

2 A shop buys scooters for $145 and then sells them for $260. What is the percentage profit?

3 A mobile phone has a price of $1159 after a 10% GST is added. What was the mobile phone's price before the GST?

4 If a buyer of a $55 000 car received a 10% discount for paying cash and then a further 3% discount in the sale, how much did he pay for the car?

5 Melanie owned $2400 of shares in XYZ Mining. After the stock market crash the shares dropped 18% in value but, in the new year, they gained 5%.
   a   What was the share price after these two percentage changes?
   b   What was the overall percentage change?

6 Calculate the simple interest earned from each investment.
   a $7200 invested at 6.25% p.a. for 3 years
   b $4050 invested at 3% p.a. for 16 months
   c $10 300 invested at 0.75% per month for 2 years.
   d $12 600 invested at 3.4% p.a. for $3\frac{1}{2}$ years

7 An investment of $8900 earned $2002.50 in simple interest after 5 years. What was the annual interest rate?

8 For how long must a principal of $4000 be invested at 6.6% p.a. for it to earn $2376 in simple interest?

9 The graph below shows the simple interest earned in dollars for n years on an investment of $25 000 at 4.5% p.a.

Simple interest earned on an investment of $25 000 at 4.5% p.a.
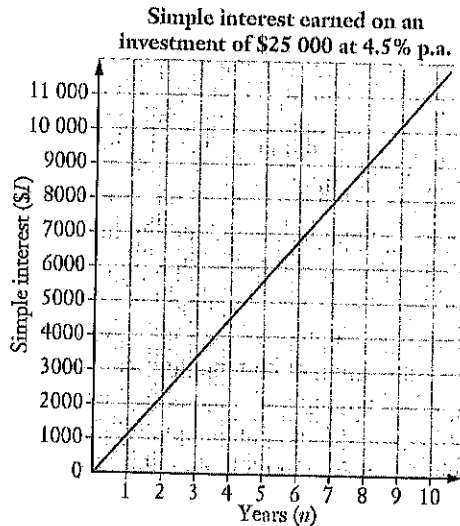
Use the graph to estimate:

a the simple interest earned after:

  i 4 years **ii** $6\frac{1}{2}$ years **iii** 10 years

b when $10 000 in interest will be earned.

10 a Construct a graph that shows the simple interest, I, earned in dollars on a principal of $4800 invested at 3% p.a. for n years, for values of n from 0 to 6.

b What is the gradient of this graph and what does it represent?

c Use the graph to estimate when $500 in interest will be earned.

11 For each investment, calculate the final amount and the compound interest earned.

a $7200 at 6.25% p.a. for 3 years

b $4050 at 3% p.a. for 16 months, compounded monthly

c $10 300 at 0.75% per month for 2 years, compounded monthly

12 What principal must be invested at 5.8% p.a., compounded annually, for it to grow to $15 000 in 8 years? (Give your answer to the nearest cent.)

13 A loaf of bread currently costs $3.60. Calculate its cost in 4 years' time if the inflation rate is 2.8% p.a.

14 Use the table to calculate the final amount and compound interest earned when $9000 is invested at 10% p.a. for 2 years, compounded half-yearly.

Compounded values of $1			
	Interest rate per period		
Periods	1%	5%	10%
1	1.010	1.050	1.100
2	1.020	1.103	1.210
3	1.030	1.158	1.331
4	1.041	1.216	1.461
5	1/051	1.276	1.611

15 Max bought a new tractor for $130 000. He wants to claim its depreciation as a tax deduction. If his tractor depreciated at $13 000 p.a., use the straight-line method of depreciation formula to find:

a the value of the tractor after 8 years

b the depreciation in the 9th year.

16 A new van cost $67 000, including registration and insurance. It depreciates by the same amount each year and after 6 years is expected to be worth $16 000 as a trade-in on another van.

a What is the yearly depreciation of the van?

b Draw up a depreciation schedule showing the value of the van for the first 6 years and the accumulated depreciation.

c What will be the trade-in value of the van after 5 years?

d What is a linear function that can be used to model the depreciation of the van?
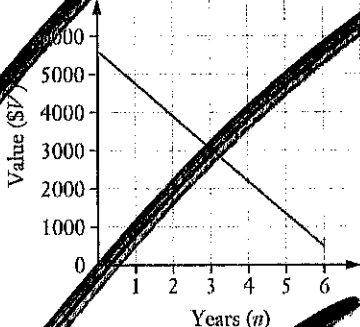
Chapter quiz

SOLUTIONS

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ears

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ears

).22

4 5

43 600 35 000

d $78 00 , the purchase price

e $5 000   **f** years

8 **a** $5600, the purchase price

   b **i** $850   **ii** $ 00

   c **i** $3900   **i** $2200

   d $500

9 **a**

Years (n)

   b $5 00, the purchase pric

   c .4 years   **d** $2\frac{1}{2}$ years

   e $4300

10 **a** $19 000

   b **i** $13 0   **ii** $ 000
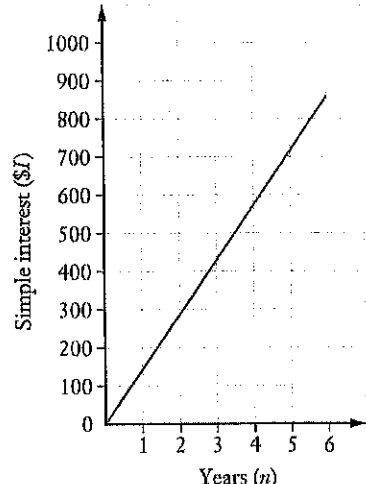
   c $20 0

Samp HSC proble

   a $2925   **b** $3119.24

   c Because i erest is calculated on ccumulated interes s well.

Test yourself 8

1 $76 608   **2** 79.3%

3 $1053.64   **4** $48 015

5 **a** $2066.40   **b** 13.9% decrease

6 **a** $1350   **b** $162   **c** $1854

   d $1499.40

7 4.5%   **8** 9 years

9 **a** **i** $4500   **ii** $7300

     iii $11 300

   b 8.9 years

10 **a**

Simple interest earned
on $4800 at 3% p.a.

Years (n)

   b 144, the interest earned per year

   c $3\frac{1}{2}$ years

11 **a** $8636.13, $1436.13   **b** $4215.07, $165.07

   c $12323.05, $2023.05

12 $9554.46   **13** $4.02

14 $10 944, $1944

15 **a** $26 000   **b** $13 000

16 **a** $8500

   b

Year	Accumulated depreciation ($)	Value at end of period ($S)
0	0	67 000
1	8500	58 500
2	17 000	50 000
3	25 500	41 500
4	34 000	33 000
5	42 500	24 500
6	51 000	16 000

   c $24 500   **d** $S = 67\,000 - 8500n$

Chapter 9

SkillCheck

1 **a** $1776   **b** $9100   **c** $14 352

   d $229.50   **e** $42