

Percentages

Percentages

Percentages are often used as a convenient way of representing a fraction or proportion of an object. The word **percent** originates from the Latin term **per centum** which means **per hundred**. The symbol for percentage is %.

Example 65% means 65 per 100 or 65 out of 100

Examples

1. Find the percentage of this shape that is shaded.

This can be found by dividing the shape into 100 equal parts. Then find out how many of these parts are shaded. It can be seen that 20 of the 100 equal parts are shaded. Therefore **20** *percent* of the shape is shaded. This can be written as **20%**.



2. What percentage of the above shape is *not* shaded? The total number of equal parts is 100 so the number that is not shaded is 100 - 20 = 80. Therefore the percentage of the shape that is not shaded is 80%.





EXERCISE 5A

- **1.** Each of the diagrams below consists of 100 small squares. For each diagram state:
 - (i) the percentage that is shaded.
 - (ii) the percentage that is not shaded.



- Catriona planted a number of beans in her vegetable garden.
 85% of the beans grew. What percentage of the beans didn't grow?
- 3. A certain paint colour requires a mixture of 10% blue, 12% red, 22% yellow and the remainder white.What percentage of the paint mixture is white?
- **4.** Three students were trying to become school captain. Quinton got 35% of the students' vote, Gemima got 29% of the vote and Niki got the remainder of the vote.
 - (a) What percentage of the vote did Niki receive?
 - (b) Who will be the school captain?
- **5.** A confectionary company makes chocolates, soft lollies and hard lollies. 45.6% of the sweets they produce are chocolates and 27.7% are hard lollies.

What percentage of the sweets are soft lollies?





(b) What percentage of the area of Australia is the Northern Territory?

7. Three boxes make up the load on the back of a truck. The weights of the boxes are proportional to their sizes as shown in the diagram.

From the alternatives



below (**A-G**) which would be the best estimate of the percentage of the total weight of the load that is:

(a) box I (b) box II (c) box III

A 75% **B** 55% **C** 45% **D** 40% **E** 30% **F** 20% **G** 15%

- **8.** Salvador made 1 litre of garden fertilizer using 2% liquid seaweed, 5% liquid manure and the remainder water.
 - (a) What percentage of the fertilizer was water?
 - (b) If Salvador wanted to make 2 litres of the fertilizer, what percentage of it should be liquid seaweed?
- **9.** Anneke had a special recipe for making jam using mulberries, blackberries and strawberries. The recipe required the weight of mulberries to be the same as the weight of blackberries and twice the weight of strawberries. The weight of sugar added is equal to the total weight of all the berries.

What percentage of the total mixture is each ingredient?

Converting Fractions to Percentages

EXERCISE 5B

1. Convert the following fractions to percentages.

Exam	ple	$\frac{3}{5}$	$\frac{3}{5} = \frac{3}{15}$ $= \frac{3}{15}$ $= \frac{6}{10}$	$\times \frac{100}{1} \times \frac{100}{1}^{20}$		To conv a perce multipl	vert a ntage y by 1	fraction - 100.	e to
(a)	$\frac{1}{10}$	(b)	$\frac{3}{10}$	(c)	$\frac{9}{10}$	(d)	$\frac{1}{2}$	(e)	$\frac{1}{5}$
(f)	$\frac{3}{4}$	(g)	$\frac{7}{20}$	(h)	$\frac{13}{50}$	(i)	$\frac{12}{25}$	(j)	$\frac{120}{200}$
(k)	$\frac{40}{80}$	(1)	$\frac{60}{75}$	(m)	$\frac{40}{160}$	(n)	$\frac{240}{500}$	(0)	$\frac{126}{210}$

2. 60 young people between the ages of 16 and 18 were surveyed and it was found that 45 of them had their learner's permit to drive a car. (a) What percentage of the group had their learner's permit?(b) What percentage did not have their learner's permit?

3. All the year 8 students at a school were asked to state their favourite type of movie out of the following categories:

Mystery Romance Action Comedy Horror The results are shown on this column graph.

- (a) How many students are in year 8 at the school?
- (b) Find the percentage of the students that chose each type of movie.



9]

4. Jordan achieved the following marks on tests.

Science
$$\frac{76}{95}$$
 Maths $\frac{68}{80}$ German $\frac{54}{72}$ English $\frac{54}{75}$

92

Change each mark to a percentage.

5. Write the first quantity as a percentage of the second.

_		
Examples	Make sure the units are the	<mark>he same.</mark>
1. 2 kg, 10 kg	2. 60 cents, \$2	3. 85 cm, 5 m
$=\frac{2}{10}\times\frac{100}{1}$	= 60 cents, 200 cents	= 85 cm, 500 cm
= 20%	$= \frac{60}{200} \times \frac{100}{1}$	$=\frac{85}{500} \times \frac{100}{1}$
	= 30%	= 17%
(a) 8 kg, 20 kg	(b) 75 mm, 300 m	m (c) \$45, \$500
(d) 40 cents, \$8	(e) 400 mm, 2 m	(f) 150 g, 3 kg
(g) 36 sec, 1 m	in (h) 12 min, 2 hour	rs (i) 50 mm, 20 cm
(j) 240 mL, 3 L	(k) 380 kg, 2 tonn	es (1) 81 cm, 3 m

Converting Percentages to Fractions

EXERCISE 5C

1. Convert the following percentages to fractions.

 Example
 23% $23 \div 100$ To convert a percentage to a fraction - divide by 100.

 (a)
 1% (b)
 11% (c)
 19% (d)
 73% (e)
 99%

2. Convert the following percentages to fractions. Write answers in their simplest form.

(a)	5%	(b) 12%	(c) 18%
(d)	25%	(e) 35%	(f) 50%
(g)	60%	(h) 76%	(i) 95%
(j)	100%	(k) 150%	(l) 600%

Example	45%	45 ÷ 100
		$=\frac{45^{9}}{20}$
		100 ²⁰
		$=\frac{y}{20}$

Converting Decimals to Percentages

EXERCISE 5D

Convert the following decimals to percentages.

Example	$0.21 0.21 \times = 0.21 \times = 2$	100 To 21 per 1% 2 p	convert a dec centage - mi we the decim laces to the r	cimal to a ultiply by 100. al point ight.
1. 0.33	2. 0.19	3. 0.87	4. 0.06	5. 0.4
6. 0.295	7. 0.056	8. 0.008	9. 2	10. 0.1057

Converting Percentages to Decimals

EXERCISE 5E

Convert the following percentages to decimals.

Example	$37\% 37 \div 37$	100 To 37. Ma 0.37 2 p	convert a pe a decimal - d ove the decim places to the l	rcentage livide by 100. al point left.
1. 59% 6. 10%	 2. 24% 7. 100% 	3. 76% 8. 65.4%	4. 30% 9. 5.8%	5. 8% 10. 0.25%

Conversions

EXERCISE 5F

Copy and complete this table. Write all fractions in their simplest form. One line has been completed as an example.

Percentage	Fraction	Decimal
50%	$\frac{1}{2}$	0.5
10%		
	$\frac{1}{4}$	
		0.2
	$\frac{9}{10}$	
66%		
	$\frac{9}{50}$	
		0.32
	$\frac{17}{20}$	
9%		
	$\frac{3}{100}$	
		0.04

Percentages of Quantities

EXERCISE 5G

1. Copy and complete this table. You should remember all these!

Percentage	25%	50%	75%	$33\frac{1}{3}\%$	$66\frac{2}{3}\%$	10%	20%
Fraction							
Decimal							

2. Find the following qu	antities.	Example	50% of \$20	
Try to solve these pro	blems using		$=\frac{1}{2}$ of \$20	
			= \$10	J
(a) 50% of 8 m	(b) 25% of \$4	0 (0	c) 10% of \$50	
(d) $33\frac{1}{3}\%$ of 9 kg	(e) $66\frac{2}{3}\%$ of 9	kg (f) 75% of 12 m	
(g) 50% of \$120	(h) 25% of \$4	00 (i) $33\frac{1}{3}\%$ of 30 km	m
(j) 10% of 250 kg	(k) 50% of \$8	000 (1) 20% of 500 kg	g
(m) 50% of \$5	(n) 10% of \$3	(0	b) $66\frac{2}{3}\%$ of \$3.9	0

3. Find the following quantities

Find the following qu	antities. <i>Exa</i>	<i>ample</i> 20% of \$480
		$= \frac{2\emptyset}{1\emptyset\emptyset} \times \frac{48\emptyset}{1}$ $= \$96$
(a) 60% of 200 kg (d) 30% of \$700	(b) 15% of 600 1 (e) 45% of 3000	m (c) 80% of \$120 m (f) 55% of 80 m
(g) 85% of \$60 (i) 16% of 250 kg	(h) 5% of \$420 (k) 35% of \$90	(i) 8% of 350 km (l) 24% of 560 kg
(m) 2% of \$5	(n) 19% of \$12	(o) 12% of \$358

4. Use a calculator to find the following quantities.

(a) 62% of 450 kg	(b) 19% of 850 m	(c) 23% of \$2580
(d) 47% of \$2400	(e) 82% of 3675 m	(f) 11% of 3.5 m
(g) 6.5% of \$750	(h) 8.5% of \$42000	(i) 12.75% of \$84700

5. Con the fruiterer found that 10% of the mangoes he bought were bruised. If he bought 80 mangoes, how many could he expect to be bruised?

- **6.** About 10% of the population are left-handed. In a school of 800 students, how many students could be expected to be left-handed?
- 7. About 7% of men and 1% of women are colour blind. In a school of 800 students with an equal number of boys and girls:
 - (a) how many of the boys could be expected to be colour blind?
 - (b) how many of the girls could be expected to be colour blind?
- **8.** Use the statistics shown in questions 6 and 7 to help you answer this question. In an Arts College there were 500 students of which 60% were female.
 - (a) How many of the female students would be expected to be left-handed?
 - (b) How many of the male students would be expected to be colour blind?
 - (c) What is the total number of students that would be expected to be left-handed?
 - (d) What is the total number of students that would be expected to be colour blind?
- 9. Fiona and Louise were the two goal shooters in a netball team.
 In one season Fiona had 440 shots at goal and scored 70% of these.
 Louise had 530 shots at goal and scored 60% of these.
 - (a) Calculate how many goals each player scored in the season.
 - (b) Who do you think is the better player? Why?



- **10.** Stefan's resting heart rate was 80 beats per minute. After exercise his heart rate had increased by 30%. What was his new heart rate?
- 11. A dairy farmer was getting an average of 4500 litres of milk a day from his herd. He was told that if he changed the feed for his cows he could expect a 5% increase in milk production.What would be the new average daily volume of milk if he changed to the new feed?

- **12.** In a town where there were 6000 people of working age, the unemployment rate was 7%.
 - (a) How many people were unemployed?
 - (b) What was the percentage of people that had employment?
 - (c) How many people had employment?

A new business opens in the town and the unemployment rate dropped to 5%.

- (d) How many people did the new business employ?
- **13.** The population of Giant Pandas in the wild is about 1200.
 - (a) If the population was to increase by 5% one year, what would be the population at the end of the year?
 - (b) If the population was to increase by 5% of this amount in the following year, what would then be the population of Giant Pandas?



- 14. A conservation organisation bought a 20 000 hectare property that had been cleared for farming. The conservationists planned to revegetate 20% of the property each year.
 - (a) How many years will it take to fully revegetate the property?
 - (b) How many hectares will be revegetated each year?
- **15.** Harry had \$6000 in a bank account that earned 5% interest each year.
 - (a) How much interest will his investment earn in one year?
 - (b) If he leaves this interest in the bank with the \$6000, how much interest will this total amount earn in the next year?
- 16. A farm had access to 250 megalitres (ML) of water.
 - (a) The farmer was allowed to use 4% of this water each week for irrigating his farm. How many megalitres could he use each week?
 - (b) For how many weeks could he irrigate his farm?
 - (c) What percentage of the water had he used after twelve weeks?
 - (d) How many megalitres had he used after twelve weeks?

Discounts

EXERCISE 5H

Example A 25% discount is offered on a \$40 shirt. What will you pay for the shirt? 25% of \$40 is \$10 The *discount* is **\$10** You will pay \$40 - \$10 = **\$30**

- **1.** Bloom 'n' Gardens is a nursery that is having a sale on its plants. For the plants shown below find:
 - (i) the amount of the discount.
 - (ii) the amount you will pay.
 - (a) 30% discount on \$40 fruit trees.
 - (b) 25% discount on \$60 ornamental maples.
 - (c) 40% discount on \$30 native plants.
 - (d) 15% discount on \$60 flowering gums.
 - (e) 50% discount on \$85 palm trees.
- 2. Find the price that you will pay for the following items.

Item and Price	Discount
(a) Fishing Rod - \$80	20%
(b) CD - \$30	10%
(c) Electric Guitar - \$600	25%
(d) Car - \$25 000	5%
(e) TV - \$350	30%
(f) Washing machine - \$600	35%
(g) Caravan - \$3400	12%
(h) Antique clock - \$690	$33\frac{1}{3}\%$

Mark-ups

A *retailer* purchases its goods for a price called the *wholesale price*. It will then add on an amount (often a percentage of the wholesale price) to find the *retail price* (selling price). This amount added on is called the *mark-up*.

A business that produces products will add an amount onto the cost to produce its products to find its selling price. This amount is also called the mark-up and is often a percentage of the cost to produce a product.

selling price = production cost + mark-up

Examples

 Karryn owns a horse accessories shop. She can buy saddles for a wholesale price of \$1200 and decides to add a mark-up of 40%. What will be the retail price of the saddles?

```
mark-up = 40\% of $1200
= 0.4 \times 1200
mark-up = $480
```

retail price = wholesale price + mark-up = \$1200 + \$480 retail price = \$1680

2. Aaron is a cabinet maker who makes and sells furniture. To make a chair it costs Aaron \$50 in materials and \$70 in labour. Aaron decides to add a mark-up of 30%. For what price should he sell his chairs?

cost to produce chair = $$50 + 70
cost to produce chair = \$120
*
mark-up = 30% of \$120
$= 0.3 \times 120$
mark-up = \$36
selling price = production cost + mark-up
= \$120 + \$36
selling price = \$156
01

EXERCISE 5I

- **1.** A surf shop buys surf boards for a wholesale price of \$250 each. They decide to add a mark-up of 40%. For what price should they sell the surf boards?
- **2.** A computer shop buys a particular laptop at a wholesale price of \$200. The mark-up they have on their computers is 80%. What will be the retail price of the laptops?
- **3.** A potter makes clay pots and calculates it costs him \$30 to produce each pot. It he adds a mark-up of 50%, for what price should he sell his pots?
- **4.** A bakery produces pies and they calculate it costs them \$600 to produce 300 pies. They mark-up their products by 70%. What should be the selling price for *each pie*?
- **5.** A clothing store buys 200 T-shirts for \$500. They mark-up the wholesale price by 100%. What is the retail price of *each T-shirt*?



- 6. A car retailer bought new cars at a wholesale price of \$18 000 each. He used a mark-up of 15%. What was the retail price of the cars?
- 7. Manny makes mandolins and guitars. It costs him \$500 to make a mandolin and \$950 to make a guitar. He uses a mark-up of 30% when selling his instruments. What is the selling price of a mandolin and guitar?



- **8.** An apiarist produces and bottles honey from his bee hives. He calculates that it costs him \$18 to produce a 1 kg jar of honey. He uses a mark-up of 40%. What will be his selling price for a jar of honey?
- **9.** Kylie sells teddy bears at markets. She buys three different sizes and the wholesale prices of these are shown below.

Pappa Bear - \$32 Mamma Bear - \$25 Baby Bear - \$16



Kylie adds a mark-up of 60% onto the price of her teddy bears. What will be her selling price for the teddy bears at the markets?

10. Michael owns a bicycle shop. He bought a number of mountain bikes at the wholesale price of \$450. His mark-up is 40%. He had sold most of them but had two remaining and wanted to sell these quickly to buy a new model. He offered these two at a discount of 20% off retail price.

What was the discounted price?



Profit and Loss

Profit in business is defined as the amount of financial gain over a period of time or from a number of transactions. It is the difference between the income and the expenses when the income is greater than the expenses.

When the income is greater than the expenses: profit = income - expenses

Loss in business is defined as the amount of financial loss over a period of time or from a number of transactions. It is the difference between the income and the expenses when the income is less than the expenses.

When the income is less than the expenses: loss = expenses - income

The profit or loss can be expressed as a percentage of the income.

```
profit/loss as percentage of income = \frac{\text{profit or loss}}{\text{income}} \times 100
```

Examples

- 1. Harriot buys a camera for \$200 and sells it for \$250.
 - (a) Did she make a profit or loss on the camera?
 - (b) What was the size of the profit or loss?
 - (c) What was the percentage profit/loss?

Answers

- (a) income = \$250
 - expenses = \$200
 - income is greater than expenses so she made a profit
- (b) profit = income expenses profit = \$250 - \$200 *profit* = **\$50**

continued next page

Example 1 answers continued

(c) percentage profit =
$$\frac{\text{profit}}{\text{income}} \times 100$$

= $\frac{50}{250} \times 100$
percentage profit = 20%

2. A small art gallery sells artwork and has functions.

In one year the income and expenses for the gallery are shown in the table below.

(a) Did the art gallery make a profit or loss for the year?

- (b) What was the size of the profit or loss?
- (c) What is the percentage profit/loss? Round to one decimal place.

Income		Expenses	
Sales	\$98 500	Artwork	\$35 500
Functions	\$28 500	Wages	\$75 000
Total	\$127 000	Other costs	\$20 500
		Total	\$131 000

Answers

(a) The total income for the year was \$127 000.

The total expenses were \$131 000.

The income is less than the expenses so the gallery had a *loss*.

(b) loss = expenses - income

$$=$$
 \$131 000 - \$127 000

loss = \$4000

$$=\frac{4000}{127\ 000} \times 100 \quad Use \ calculator$$

percentage loss = 3.1% (rounded to one decimal place)

EXERCISE 5J

- **1.** Kyle bought a broken lawn mower for \$120. He repaired it and sold it for \$200.
 - (a) Did he make a profit or loss on the lawn mower?
 - (b) What was the size of the profit or loss?
 - (c) What was the percentage profit/loss?
- **2.** A farmer bought a number of calves for \$500. He sold them two years later for \$5000. He estimated he spent \$3500 on feed, etc..
 - (a) Did he make a profit or loss on the cows?
 - (b) What was the size of the profit or loss?
 - (c) What was the percentage profit/loss?
- **3.** A lunch food outlet calculated their income for a month was \$16 000. Their expenses for the month were \$20 000.
 - (a) Did they make a profit or loss for the month?
 - (b) What was the size of the profit or loss?
 - (c) What was the percentage profit/loss?
- **4.** A sports store bought cricket bat, ball and stumps kits for a wholesale price of \$300 and used a mark-up of 60%.
 - (a) Do they make a profit or loss on each cricket kit?
 - (b) What was the size of the profit or loss?
 - (c) What was the percentage profit/loss?



5. Jessie makes jewellery part time and sells it at markets and online.

In one year she had a total income from her jewellery business of \$10 000.

Her expenses for the year are shown in this table.

- (a) Do she make a profit or loss for the year?
- (b) What was the size of the profit or loss?
- (c) What was the percentage profit/loss?

Expenses		
Materials	\$2000	
Markets	\$500	
Other	\$1500	

- 6. Ray's Reef Resort is a business on the Great Barrier Reef. He offers reef tours, hire of diving equipment, meals and accommodation. The tables below show the income and expenses for a year.
 - (a) Did Ray make a profit or loss for the year?
 - (b) What was the size of the profit or loss?
 - (c) What was the percentage profit/loss? Give answer rounded to *one* decimal place.

Income		
Tours	\$46 000	
Equipment hire	\$18 500	
Meals	\$35 500	
Accommodation	\$90 000	

Expenses				
New equipment	\$23 000			
Equipment maintenance	\$12 500			
Food and drinks	\$19 500			
Wages	\$80 000			
Other	\$25 000			



7. The top six sellers from the Super Hero Costume Shop are listed below along with the wholesale price and retail price.

List the costumes in order from the one with the largest percentage profit to the one with the smallest percentage profit.

Costume	Wholesale Price	Retail Price
Batman	\$35	\$60
Spider Man	\$26	\$50
Superman	\$25	\$45
Cat Woman	\$23	\$45
Hulk	\$24	\$40
Wonder Woman	\$20	\$35

GST

The Goods and Services Tax (GST) is a tax on most goods and services. In Australia the GST is 10%.

Examples

1. A cabinet maker builds a table and intends to make \$120 when he sells it. How much GST should he add to this price to find the retail price?

Answer: GST is 10%.

$$10\% \text{ of } \$120$$

= $\frac{10}{100} \times \$120$
= $\$12$

The retail price = \$120 + \$12 = \$132

2. A plumber wants to make \$50 an hour for his labour costs. What GST should he add to this amount?

Answer: GST is 10%. 10% of \$50 $= \frac{10}{100} \times \50 = \$5

Labour charge = \$50 + \$5 = \$55

3. A school magazine is printed for a total cost of \$880. How much of this cost is GST?

To find the GST paid, the amount needs to be divided by 11.

$$GST = \frac{\$880}{11} = \$80$$

EXERCISE 5K

- 1. For the following items the prices shown are before the GST has been added. For these items:
 - (i) find the GST that needs to be added.
 - (ii) find the retail price.

	Item	Price before GST is added
(a)	Television	\$450
(b)	Car	\$18 500
(c)	Book	\$36
(d)	Calculator	\$105
(e)	Hammer	\$25
(f)	Jeans	\$68

- **2.** An apprentice electrician plans to start his own business when he finishes his apprenticeship. He decides he wants to earn \$60 an hour.
 - (a) How much GST should he add to this amount to find the hourly rate he should charge?
 - (b) After starting his business how much GST will he charge on jobs that take the following times?
 - (i) 3 hours (ii) 7 hours (iii) 13 hours
- **3.** The table below shows a number of items and their retail prices that include GST. Find the amount of GST included in each item's price.

	Item	Price after GST is added
(a)	Computer	\$660
(b)	Caravan	\$25 300
(c)	Basketball	\$61.60
(d)	Travel Ticket	\$3520
(e)	Antique Clock	\$412.50
(f)	Magazine	\$7.15



PROBLEM SOLVING

1. Complete the following pattern.

```
50\%, 33\frac{1}{3}\%, 25\%, 20\%, 16\frac{2}{3}\%, \_, \_, \_, \_
```

- 2. Lee won a prize in the lottery. He gave a quarter of the prize money to medical research, 30% to his family and 20% to his friends. He had \$300 000 left for himself. How much did he win?
- **3.** Emma bought a shirt that had been discounted by 20%. She paid \$40 for the shirt.

What was the price of the shirt before it was discounted?

PUZZLES

1. Complete the diagram below by finding the word on each line. Each word can be found by adding one letter to the line above it and rearranging the letters.

A clue for each word is given.



2. Which of the alternatives below would be this 100% symbol after it was reflected in a mirror.







CHAPTER REVIEW

- 1. (a) Barbara achieved 68 out of 100 for a science test. What percentage is this?
 - (b) Quinton achieved 40 out of 50 for a mathematics test. What percentage is this?
- **2.** Denzel made some two stroke fuel by mixing petrol and oil. 95% of the fuel is petrol.
 - (a) What percentage of the fuel is oil?
 - (b) What fraction of the fuel is oil?
- **3.** Teresa is a painter. She is going to paint a room with a paint mix that contains red, yellow and white.

10% of the mix is red and 20% is yellow.

- (a) What percentage of the paint mix is white?
- (b) If she wants to make 20 litres of paint, how much of each colour should she use?

4. Copy and complete this table.

Percentage	10%				1%		
Fraction		$\frac{1}{4}$		$\frac{1}{5}$		$\frac{1}{3}$	
Decimal			0.5				0.7

5. Find the following quantities using mental arithmetic.

(a) 10% of \$80	(b) 25% of 200 m	(c) $33\frac{1}{3}\%$ of 90 kg
(d) 50% of \$180	(e) $66\frac{2}{2}\%$ of 3 m	(f) 75% of 16 kg

6. Find the following quantities.

(a) 20% of \$300	(b) 70% of 580 m	(c) 85% of 300 kg
(d) 7% of \$8	(e) 23% of 300 m	(f) 55% of \$75

- 7. The frog population of Shady Creek was decreasing at the rate of 10% each year. The population was estimated to be 5000. What would be the expected population a year later?
- **8.** Find the price paid for the following items.
 - (a) \$150 wetsuit with a 20% discount.
 - (b) \$80 jumper with a 10% discount.

	Model	Wholesale Price
(a)	Car	\$40
(b)	Aeroplane	\$65
(c)	Ship	\$84

9. A hobby shop adds a 40% mark-up onto the wholesale price of their models. Find the retail price for the following models.

- **10.** Leni bought an old antique doll for \$150. She spent \$120 repairing it and sold it for \$200.
 - (a) Did Leni make a profit or loss on the doll?
 - (b) What was the size of the profit or loss?
 - (c) What was the percentage profit/loss?
- **11.** Tim is a part time photographer. The income and expenses for his photography business for one year are shown below.

Income			
Sales of Photos	\$8000		
Book Sales	\$4500		
Functions	\$2500		

Expenses		
Equipment	\$2000	
Printing Costs	\$5000	
Framing	\$2500	
Other	\$1000	

- (a) Did Tim make a profit or loss from his photography business?
- (b) What was the size of the profit or loss?
- (c) What was the percentage profit/loss?
- **12.** For the following items the prices shown in brackets are before the GST has been added. For these items:
 - (i) find the GST that needs to be added.
 - (ii) find the retail price.
 - (a) bicycle (\$400) (b) power saw (\$120) (c) board game (\$76)
- **13.** For the following items the retail price including GST is shown in brackets. Find the amount of GST included in each item's price.
 - (a) phone (\$385) (b) binoculars (\$148.50) (c) motorcycle (\$5940)