TOPIC 18
Money

18.1 Overview

Numerous **videos** and **interactivities** are embedded just where you need them, at the point of learning, in your learnON title at www.jacplus.com.au. They will help you to learn the concepts covered in this topic.

18.1.1 Why learn this?

Money is part of our everyday life. We need to understand money and finance because decisions we make concerning money will have significant influence on our future wellbeing.

18.1.2 What do you know?

assesson

1. **THINK** List what you know about money. Use a thinking tool such as a concept map to show your list.
2. **PAIR** Share what you know with a partner and then with a small group.
3. **SHAPE** As a class, create a thinking tool such as a large concept map that shows your class's knowledge of money.

LEARNING SEQUENCE

18.2 Money

In most modern societies, money is used as a medium of exchange for goods and services.

18.2.1 Operations with money

- Australian currency is a decimal system using dollars and cents. There are 100 cents in a dollar.
- To change dollars to cents, you multiply by 100. Multiply, because there will be more cents than dollars.
- To change cents to dollars, you divide by 100. Divide, because there will be fewer dollars than there are cents.
- The Australian government withdrew one-cent and two-cent coins in 1990. Prices are still expressed in one-cent increments. When payment is made by cheque, credit card or electronic means, the exact amount is paid in dollars and cents.
- When cash is being used, amounts are rounded to the nearest 5 cents. For example, 61 cents and 62 cents would be rounded down to 60 cents while 63 cents and 64 cents would be rounded up to 65 cents. Similarly, 66 cents and 67 cents would be rounded down to 65 cents while 68 cents and 69 cents would be rounded up to 70 cents.

WORKED EXAMPLE 1

a Change \$2.45 into cents.
b Write 20c in dollars.

THINK	WRITE
a 1 Write the given amount and change dollars to cents by multiplying by 100.	**a** $2.45 = (2.45 \times 100)$ cents
2 Write the answer.	$= 245$ cents
b 1 Write the given amount and change to dollars by dividing by 100.	**b** $20c = \$(20 \div 100)$
2 Write the answer.	$= \$0.20$

- To do our shopping, we must be able to use money, to estimate our total shopping bill and calculate the change that we can expect. Most importantly, we need to be able to budget. This means thinking about our available funds before we make a purchase.

WORKED EXAMPLE 2

A $100 note is used to pay for the following:
2 packs of socks @ $16.95 per packet
3 packs of golf balls @ $19.95 per packet.
Estimate the total bill and the change, then find the exact amount for each.

THINK	WRITE
1 Round the cost of the socks to the nearest dollar.	Socks: about $17 per pack
2 Round the cost of the golf balls to the nearest dollar.	Golf balls: about $20 per pack
3 Find the total estimated cost of the socks and golf balls.	Total estimated cost in dollars $= 2 \times 17 + 3 \times 20$ $= 94$
4 Find the change by subtracting the total cost of the purchases from the amount tendered.	Estimated change in dollars $= 100 - 94$ $= 6$
5 Answer the question in a sentence.	The estimated total cost is $94 and the change from $100 is $6.
6 Find the exact cost of the socks and the golf balls.	Total cost $= 2 \times 16.95 + 3 \times 19.95$ $= 33.90 + 59.85$ $= 93.75$
7 Find the change given.	Change $= \$100 - \$93.75$ $= \$6.25$
8 Answer the question in a sentence.	The total cost of the socks and the golf balls is $93.75 and the change from $100 is $6.25.

- Each pair of socks and each pack of golf balls costs 5 cents less than the estimated cost, so the total cost of the goods is (5×5) cents or 25 cents less than the estimated cost.

Exercise 18.2 Money

Individual pathways

■ PRACTISE	■ CONSOLIDATE	■ MASTER
Questions:	Questions:	Questions:
1, 2, 3, 4, 5, 6, 9, 13, 14, 16, 20	1, 2, 3, 4, 5, 7, 8, 10, 12, 13, 14, 16, 18, 20, 21	1, 2, 3, 4, 5, 6, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21

■ ■ ■ **Individual pathway interactivity:** int-4394

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Fluency

1. **WE1a** Change each of the following into cents.
   a. $7.55 **b.** $3.05 **c.** $2.40 **d.** $9

2. **WE1b** Change each of the following to dollars.
   a. 685 cents **b.** 450 cents **c.** 5 cents **d.** 805 cents

3. Round the following to the nearest 5 cents.
   a. $4.76 **b.** $12.61 **c.** $159.28 **d.** $83.44

Understanding

4. The students of Year 9 have raised $245.40 for charity and want to share the money equally among the Children's Hospital, the Guide Dog Appeal and the Red Cross Shield Appeal. How much money will be given to each charity?

5. The cost of 5 packets of chocolate biscuits and a 2-litre bottle of milk was $15.60. If the bottle of milk cost $4.35, how much did a packet of chocolate biscuits cost?

Questions **6–12** refer to these advertised products.
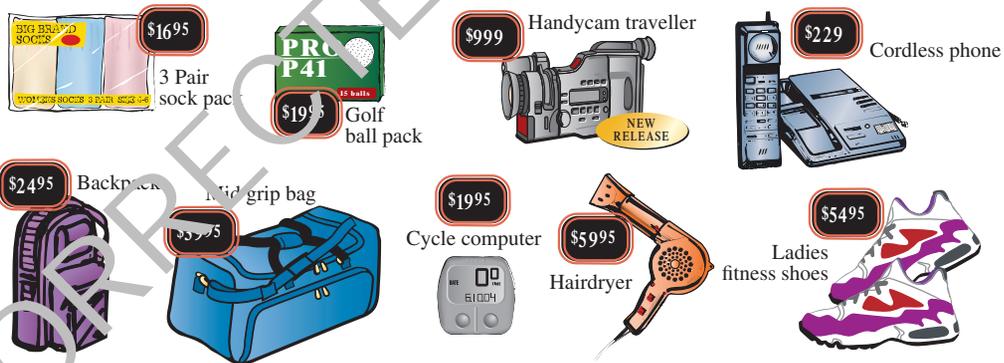
6. How much change would you receive from $50 if you purchased:
   a. the socks **b.** the cycle computer **c.** the backpack?

7. Rani can save $15 per week. How many weeks will it take for her to save enough to buy the fitness shoes?

8. John has just selected a new set of golf clubs worth $489.95. He then buys two golf ball packs. What is his total outlay?

9. Janine has just started full-time work. She pays a $100 deposit on the Handycam and the balance in 10 equal monthly instalments. How much is each instalment, assuming she pays no interest charges?

10. Nicole needs a new hairdryer. Her dad lends her $60 to buy the one shown. She agrees to work for him in order to pay him back. They agree on $8 per hour. For how long will she have to work to clear the debt?

11. Veda buys the cordless phone with a $50 deposit and 6 payments of $35 each. How much more than the advertised price does she finally pay? Why would this be?

12. For her birthday, Cristi was given the advertised fitness shoes, the backpack, the socks and the hairdryer by her family. If four people split the expense evenly, how much did each person pay?

For questions **13** and **14**, estimate, then find, the exact value for:

    a. the total bill   **b.** the change.

13. **WE2** A $20 note is used to pay the supermarket bill after purchasing these goods:
    3 packets of soup @ $1.89 per packet
    2 packs of pasta @ $1.24 per packet
    2 boxes of cereal @ $2.95 per box.

14. $30 is used to pay the fruit shop for:
    3 kg bananas @ $1.99 per kg
    4 kg apples @ $2.95 per kg
    2 kg oranges @ $3.25 per kg
    $\frac{1}{2}$ kg mushrooms @ $3.90 per kg.

15. A petrol rewards card gives a discount of 4 cents per litre. If I purchase 37.62 litres of petrol at a price of $1.379 per litre then:
    a. how much is the cost of the fuel before the discount
    b. using the petrol rewards card, what is the discount
    c. how much change will I receive if I used $60.00 cash to make the purchase?

Reasoning

16. Sam and Georgia were paid a total of $167.00 for painting a fence. Sam worked for 12 hours and Georgia worked for 8 hours. How much should each person receive?

17. Olivia has 78 fifty-cent coins and 43 two-dollar coins. What percentage of her money is made up of two-dollar coins? Show your working.

18. Fifty people, half of whom were females, were asked if they liked yoghurt. Twenty-seven of the people, including two-fifths of all the males, said they did like yoghurt. How many of the females did not like yoghurt? Show your working.

19. Ingrid offered to pay her brothers $2 for doing her share of the housework each day, but fined them $5 if they forgot to do it. After 4 weeks, Ingrid discovered that she owed her brothers nothing. For how many days did Ingrid's brothers do her share of the housework? Justify your answer.

Problem solving

20. Year 12 students at Minnicom College decided to have a pizza-and-pasta day on the last day of term. Mrs Day decided to offer a limited choice of food and a drink. The restaurant charged her the following: marinara, $6.00; lasagne, $6.50; any small pizza, $5.00. The local supermarket sold drinks for $6.40 per dozen.
    a. If 70 students chose pizzas, 15 chose lasagne and 8 chose marinara, and everyone gets a drink, what is the overall cost of the day?
    b. If each student is to be charged the same amount, how much will that be? (Remember to round your answer to the nearest 5c.)
    c. If there is any change left over, how much is there, and what would you do with it?

21. Christine and Con made a certain number of telephone calls over a 3-month period. There is a charge of 22 cents for each call, and the monthly rental of the phone line is $15.20. The bill for the 3 months comes to $138. How many calls did they make in the 3-month period?

Reflection

In what situations would estimation be useful?

18.3 Money and percentages

- Signs like those shown above are common when stores are having a sale. To find the percentage of an amount, for example 20% of $50, follow the steps given overleaf.

  Step 1: Write the percentage as an amount out of 100. $\frac{20}{100}$ of 50

  Step 2: Change the 'of' to a multiplication sign and put the second amount over 1. $\frac{20}{100} \times \frac{50}{1}$

  Step 3: Simplify the fractions if possible. $\frac{2}{1} \times \frac{5}{1}$

  Step 4: Multiply the numerators and the denominators. $\frac{10}{1}$

  Step 5: If left with a fraction, divide the denominator into the numerator. (A calculator may be helpful here.) $10

WORKED EXAMPLE 3

Find 22% of $40.

THINK	WRITE
1 Write the question.	22% of 40
2 Write the percentage as an amount out of 100, change 'of' to × and write the second amount over 1.	$= \frac{22}{100} \times \frac{40}{1}$
3 Simplify the fractions.	$= \frac{11}{5} \times \frac{4}{1}$
4 Multiply numerators and denominators and write the answer as a mixed number or decimal if appropriate (2 decimal places for money).	$= \frac{44}{5}$ $= 8\frac{4}{5}$ or 8.8
5 Write the answer.	22% of $40 = $8.80

18.3.1 GST

- GST is an abbreviation of *Goods and Services Tax*.
- GST is a tax paid to the government for services and goods bought.
- 10% GST is paid on a bill at a restaurant.
- 10% GST is paid on clothes and other items which we buy.
- The price we see in a shop has already had GST added to it by the seller.

WORKED EXAMPLE 4

Ahmed bought a pair of jeans for $120. What was the price of the jeans before GST was added?

THINK	WRITE
1 The jeans have already had 10% added to the price tag. The jeans are worth 110%.	$110\% = \$120$
2 Need to find 1%. Divide both sides by 110.	$110\% = \$120$ $\dfrac{110}{110} = \dfrac{120}{110}$ $1\% = \$1.09$
3 To find 100%, multiply both sides of the equation by 100.	$100\% = 1.09 \times 100$ $100\% = \$109$
4 Answer the question.	The jeans were $109 before GST was added.

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📄 **Complete this digital doc:** SkillSHEET: Converting a percentage to a decimal fraction
Searchlight ID: doc-6603

📄 **Complete this digital doc:** SkillSHEET: Decreasing a quantity by a percentage
Searchlight ID: doc-6604

📄 **Complete this digital doc:** SkillSHEET: Finding a percentage of a quantity (money)
Searchlight ID: doc-6605

Exercise 18.3 Money and percentages

assess on

Individual pathways

■ PRACTISE	■ CONSOLIDATE	■ MASTER
Questions: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 17	Questions: 1 columns 2 and 3, 2, 3, 4a, d, g, 5a, d, g, i, 6a, d, g, 7, 8, 9, 10, 12, 13, 15, 17, 18	Questions: 1 column 3, 2, 3, 4c, f, i, 5c, k, 6b, e, h, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18

■■■ Individual pathway interactivity: int-4395

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Fluency

1. **WE3** Find the following percentages, rounding your answer to 2 decimal places, if appropriate.
   a. 10% of $80
   b. 20% of $50
   c. 50% of $200
   d. 8% of $30
   e. 12.5% of $200
   f. 25% of $48
   g. 6% of $75
   h. 48% of $20
   i. 35% of $15
   j. 45% of $18
   k. 5% of $142
   l. 55% of $44
   m. 7% of $350
   n. 95% of $28
   o. 12% of $35

2. Find 10% of the following amounts. (Money answers must be rounded to 2 decimal places.)
   a. $32.00
   b. $12.50
   c. $75.00
   d. $167.00
   e. $1.45
   f. $15.98
   g. $21.09
   h. $77.77
   i. $164.20

3. Look at your answer to each of the problems in question 2. Copy and complete the following sentence.

   To find 10% of an amount, move the position of the decimal point _____ place to the

   _____.

4. Calculate 10% of the following amounts by moving the position of the decimal point.
   a. $23.00
   b. $57.00
   c. $130.00
   d. $64.00
   e. $81.50
   f. $14.80
   g. $149.60
   h. $345.90
   i. $1354.90

5. Calculate 5% of the following by finding 10% and halving your answer.
   a. $12.00
   b. $36.00
   c. $68.00
   d. $24.00
   e. $90.00
   f. $110.00
   g. $45.00
   h. $27.40
   i. $12.80
   j. $33.60
   k. $508.20
   l. $235.50

6. Calculate 1% of the following by finding 10% and dividing by 10.
   a. $26.00
   b. $42.00
   c. $166.00
   d. $406.00
   e. $1620.00
   f. $14.25
   g. $7.00
   h. $3.50
   i. $16.80

7. Copy and complete the following sentence.

   To find 1% of an amount, move the position of the decimal point _____ places to the

   _____.

8. Find 15% of the following by finding 10% and 5% then adding them together.
   a. $100.00
   b. $220.00
   c. $40.00
   d. $8.00
   e. $6.20
   f. $15.00
   g. $19.80
   h. $568.20
   i. $150.00

9. **MC** a. 10% of $180.00 is:
   A. $1.80
   B. $9.00
   C. $18.00
   D. $90.00

   b. 15% of $340.00 is:
   A. $34.00
   B. $17.00
   C. $68.00
   D. $51.00

   c. 12% of $12.00 is:
   A. $1.00
   B. $1.20
   C. $1.44
   D. $2.00

   d. 64% of $75 is:
   A. $48.00
   B. $4.80
   C. $0.48
   D. $6.40

Understanding

10. Merryn's yearly salary is $46 500. How much does she pay towards her superannuation each year if 5% of her salary goes into superannuation?

11. How much would I save on a pair of shoes that normally costs $45 if there were a 15% discount storewide on all items?

12. A grocery store cut the price of Cadbury's chocolate bars by 20%. The normal price is $3.45.
    A customer who has a discount coupon is also entitled to a further discount of 7.5%. What would this customer save on the normal price?

13. **WE4** A water bill, including GST (10%), is $216.30. What is the cost excluding GST?

14. Barry's electricity bill for 3 months is $870 inclusive of the GST (10% tax).

  a. What is the initial cost of electricity?   **b.** How much is the GST?

Reasoning

15. Sam operates a fruit shop. He marks all his fruit up by 40% of their cost. If the fruit does not sell readily, he tags it with a sign 'Reduced 40%'. He has such a sign on punnets of strawberries which cost him 75 cents. How much would a customer pay for these strawberries? Justify your answer.

16. Michael arrived home from shopping and realised that he had lost his receipt. He needed to document the GST he paid for tax purposes. Michael remembered that the total amount he paid at the store was $110. He did the following calculation and discovered that he paid $10 GST: $\frac{\$110}{11} = \$10$.

To answer the questions below, consider the following information.

  i. When calculating the total price of an item in a store, the vendor adds a 10% Goods and Service Tax (GST) to the cost of the item.

  ii. GST $= 10\% \times$ original cost of the item.

  iii. Total cost of item $=$ (Original cost of item) $+$ GST.

  iv. Total cost of item $= 110\% \times$ (Original cost of item).

  a. Does Michael's calculation work in this instance? Explain.

  b. What does the number 11 represent in this calculation? Explain.

  c. If the GST % changes from 10% to 12%, would dividing by 11 give the correct amount of GST? Explain.

Problem solving

17. Stan bought 2 bottles of juice and 6 packets of chips. The total bill was $14.

  a. If the juice cost $2.80 per bottle, what did he pay for a packet of chips?

  b. What percentage of the total amount of money was the amount he paid for the juice?

  c. What percentage of the total amount of money was the amount he paid for one pack of chips?

18. The cost of hiring a taxi is $3.80 plus $1.20 per kilometre travelled.

  a. Write an equation and use it to find the maximum distance that can be travelled in a taxi for $20.

  b. If two friends were sharing the cost for the trip, what percentage would each pay?

  c. If one of the people was going to travel for half of the final distance, what percentages of the fare would each have to pay?

Reflection

Why is it important to have knowledge of percentages when dealing with money?

CHALLENGE 18.1

If each new triangle formed in the figure is an equilateral triangle, express the shaded region of the shape as a common fraction and as a percentage.
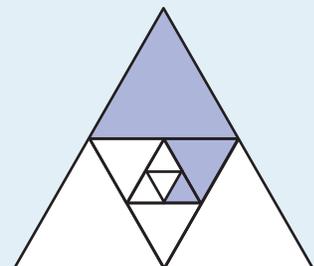
18.4 Unitary method

- Many consumers assume that if they buy the larger quantity of a product, they will be getting better value for money. This is not always the case.
- The **unitary method** can be used to work out which item is the best buy by comparing the unit price. Supermarkets in Australia are now obliged to show the unit cost on most products.
- The **unit price** is the price per unit. This may mean the price per 100 mL, the price per 100 g or the price of a single item.
- Remllember to represent the same units when you are making comparisons.

WORKED EXAMPLE 5

Three shampoos are sold in the following quantities.
Brand A: 200 mL for $5.38
Brand B: 300 mL for $5.98
Brand C: 400 mL for $8.04
Which shampoo is the best buy?

THINK

1 Determine the number of 100-mL units for each shampoo.

2 Determine the price per unit for each shampoo.

$$\text{Price per unit} = \frac{\text{price}}{\text{100-mL units}}$$

3 Answer the question for the best buy.

WRITE

Brand A $= \frac{200}{2}$

$\qquad = 2\,\text{units}$

Brand B $= \frac{300}{3}$

$\qquad = 3\,\text{units}$

Brand C $= \frac{400}{4}$

$\qquad = 4\,\text{units}$

Brand A $= \frac{538}{2}$

$\qquad = \$2.69$ per 100 mL

Brand B $= \frac{598}{3}$

$\qquad = \$1.99$ per 100 mL

Brand C $= \frac{804}{4}$

$\qquad = \$2.01$ per 100 mL

Brand B: 300 mL of shampoo for $5.98

- The smaller the unit cost, the better value of the item.

18.4.1 Unitary method in percentages

- The first step is to find 1% of the amount.
- The next step is to multiply the value of the goods by 100 to get the whole amount (100%).

WORKED EXAMPLE 6

Find the whole amount if 5% is represented by \$25.

THINK	WRITE
1 Five per cent of a number equals 25. Find 1% by dividing the number by 5.	$5\% = \$25$ $1\% = 25 \div 5$ $= 5$
2 Find 100% by multiplying the amount by 100.	$100\% = 5 \times 100$ $= \$500$

WORKED EXAMPLE 7

Ronan operates a sports store at a fixed profit margin of 65%. Ronan sells a tracksuit for \$99.95. What would Ronan have paid for the tracksuit?

THINK	WRITE
1 Write the selling price as 165% of the cost price.	165% of cost price $= \$99.95$
2 Find 1% of the cost price by dividing both sides by 165.	1% of cost price $= \$0.6057576$
3 Find 100% of the cost price by multiplying both sides by 100. Give your answer to the nearest cent.	100% of cost price $= \$60.58$
4 Answer in a sentence.	Ronan would have paid \$60.58 for the tracksuit.

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Try out this interactivity: Unitary method
Searchlight ID: int-2365

Complete this digital doc: WorkSHEET 18.1
Searchlight ID: doc-6617

Exercise 18.4 Unitary method

assess **on**

Individual pathways

■ PRACTISE	■ CONSOLIDATE	■ MASTER
Questions: 1, 2, 3, 4, 5, 6, 7, 8, 12, 18, 20	Questions: 1, 2, 3, 4b, c, e, i, 5, 6, 7, 9, 10, 13, 14, 18, 20	Questions: 1, 2, 3, 4c, f, i, 5, 6, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21

■■■ **Individual pathway interactivity:** int-4396

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Fluency

1. How much will you pay for 4.5 kg of apples, given that 2 kg cost \$3.80?

2. Compare the cost of 400 g of biscuits for \$2.48 and 500 g for \$3.10. Which is the better buy?

3. **WE5** Which of the following is the best buy?

a.

Chocolate weight	Cost
150 g	$3.25
250 g	$4.75
325 g	$5.50

b.

No. of pages	Cost
80	$1.98
160	$3.38
200	$3.98

4. **WE6** Calculate the original amount if:

a. 10% is $18
b. 20% is $6
c. 25% is $60

d. 40% is $900
e. 34% is $60
f. 90% is $380

g. 200% is $800
h. 120% is $420
i. 9% is $54.

5. Calculate:

a. 60%, if 40% is $120
b. 38%, if 20% is $6
c. 50%, if 25% is $60

d. 150%, if 50% is $900
e. 12%, if 75% is $250
f. 86%, if 14% is $4200.

Understanding

6. **WE7** The profit on an mp3 player is $240. If this is 60% of the cost price, what is:

a. the cost price
b. the selling price?

7. You spend 40% of your monthly allowance on your mobile phone. What is your monthly allowance if you spend $20 on your mobile phone?

8. Hanh saves 32% of his wages each week. If he saves $220, what is his weekly wage?

9. The retail price of in-line skates is $320. This represents 200% of the cost price. What is the cost price?

10. Alex receives a 15% pay rise. He now receives $97290 a year. How much was his annual income before the pay rise?

11. Which is the best buy?

a. 1.2 kg of apples for $5.20 or 0.75 kg of apples for $3.50?
b. 250 mL of orange juice for $2.95 or 400 mL of orange juice for $4.20?

12. Which is the best buy?

500 g of cheese for $12.80, 200 g of cheese for $5.62 or 80 g of cheese for $2.10?

13. A company made a profit of $238000. This represents a 10% increase in profit on the previous year. What was the profit that year?

14. A camping goods shop operates on a profit margin of 85%. How much would the shop have paid for a sleeping bag that sells for $89.95?

15. After a discount of 15%, an mp3 player was worth $183. What was its value before the discount?

16. During a sale, a retailer allows a discount of 15% off the marked price. His sale price of $60 still gives him a profit of 20%.

a. What did the article cost him?
b. What was the marked price?

17. A discount of 15% reduced the price of a CD by $3.20.

a. What was the original price of the CD?
b. What was its selling price?

18. A discount of 22% reduced the price of an outfit by $48.

a. What was its original price?
b. At what reduced price was it selling?

19. You buy ten pairs of head phones for $15. At what price should you sell a dozen pairs if you wish to make a profit of 25%?

Reasoning

20. An art dealer sold two paintings at an auction. The first painting sold for $7600, making a 22% loss on its cost. The second painting was sold for $5500, making a profit of 44%. Did the art dealer make an overall profit or loss? Show your working.

21. You love to make bracelets. To make them, you need to buy some beads. Brand A costs $7.50 for a box that contains 100 beads; Brand B costs $17.50 for a box that contains 2500 beads. Which brand is the better buy? Explain how you decide.

Problem solving

22. While shopping in a sale, Carly spots a sign that says 'Buy 2 items, get the third half price (the least expensive item will be counted as the third item)'. If she finds a shirt for $25.99, a skirt for $87.99 and a belt for $15.97 and pays cash for the items, how much will Carly end up paying?

23. Some players from a soccer club went to a café to celebrate their win. Each had a burger and a drink. The bill came to $80. When it came time to pay the bill, 3 people had left without paying, so the remaining members had to pay an extra $2 each to cover the bill. If there were originally n people in the group, and the burger and drink deal cost $$b$, write an equation using these pronumerals to show how the bill was settled. Do not attempt to solve your equation.

Reflection

What are the different situations in which you would use the unitary method?

CHALLENGE 18.2

The price of entry into a theme park has increased by 10% every year since the theme park opened. If the latest price rise increased the tickets to $8.80, what was the price of a ticket 2 years ago?

18.5 Review

18.5.1 Review questions

Fluency

1. Calculate these amounts.
   a. $2.45 + $13.20 + $6.05   **b.** $304.60 − $120.25   **c.** $9.65 × 7

2. What is $65.50 + $11?

3. Find 10% of each of the following by moving the position of the decimal point. Round your answer to the nearest 5 cents.
   a. $63.00   **b.** $42.00   **c.** $105.00   **d.** $216
   e. $3.45   **f.** $42.68   **g.** $118.55   **h.** $2125.85

4. Find 5% of the following by finding 10% and halving your answer. Round your answer to the nearest 5 cents.
   a. $8.00   **b.** $21.00   **c.** $64.00   **d.** $104.00
   e. $35.00   **f.** $52.00   **g.** $205.50   **h.** $77.30

5. Calculate the following. Round your answer to the nearest 5 cents.
   a. 1% of $16.00   **b.** 1% of $28.00   **c.** 12% of $42.00   **d.** 30% of $90.00
   e. 22% of $220.00   **f.** 43% of $27   **g.** 15% of $19.50   **h.** 8% of $37

6. Mentally calculate 12% of $15.

Problem solving

7. Natalie went shopping and bought a pair of bathers for $38.95, a football for $75.50, four pot plants at $8.75 each and a photograph album for $14.90. How much money did Natalie spend in total?

8. Sally bought a motorbike costing $2785. She paid a deposit of $160 then paid the remainder in 15 equal instalments. How much was each instalment?

9. Jacques' furniture shop had a sale with $\frac{1}{3}$ off the usual price of lounge suites. If the original price of a suite was $5689, what will the sale price be?

10. Heo buys a new television set marked $495. He pays a $100 deposit and 12 payments of $40 each. How much more than the marked price does he finally pay?

11. Estimate the total bill and change, then find the exact amounts when $150 is used to buy:
   10 disks at $0.95 each
   2 games at $59.95 each
   1 file box at $8.95.

12. William owns a hairdressing salon and raises the price of haircuts from $26.50 to $29.95. By what percentage did he increase the price of haircuts?
13. The price of milk increased by 8%. If the original price was $1.84, what is the new price?
14. Find:
   a. 20% of $130
   b. 10% of $25.80
   c. 15% of $68.60
   d. 42% of $20
   e. 1% of $16.70
   f. 5% of $186.40
   g. 27% of $250
   h. 12% of $36.
15. If you deposit your money in a bank, the bank will give you a small amount of money called interest. The amount of interest they give you depends on how much you have saved and for how long. It will be a certain percentage of the amount deposited. How much interest would you receive if you have $1200 in the bank and the bank calculates interest of 5% on your account balance?
16. Last year Brisbane Roar won 70% of its home and away matches. If there are 20 matches in a season, how many matches did Brisbane Roar win?
17. Sets of 90-minute CDs are sold as in the following packs. Which is the best buy?
18. Which is a better buy — 400 g of biscuits costing $2.98, or a pack of biscuits with 400 g + 25% extra, costing $3.28?

Cost ($)	Number of CDs
$3.25	6
$4.99	10
$7.50	15

19. Antwert buys a pair of jeans for $59.95. The original price tag was covered by a 30% off sticker but the sign on top of the rack said an 'Additional 15% off already reduced prices.'
   a. How much did Antwert save on the original price?
   b. What percentage of the original cost did he end up saving?
20. Café Noir charges a 1% levy on the bill for trading on Sundays. If the final bill is $55.55, what was the original price, taking into account that the 10% GST has been added and then the levy?

Language

It is important to learn and be able to use correct mathematical language in order to communicate effectively. Create a summary of the topic using the key terms below. You can present your summary in writing or using a concept map, a poster or technology.

currency	**increments**	**profit margin**
estimate	**method**	**tax**
GST	**percentage**	**unitary price**

Investigation | Rich task

Australian currency

Australia's currency is special when we compare it with the currencies of other countries throughout the world. Our coins have distinctive features and our currency notes are unique in terms of their colour and texture. Since decimal currency was introduced in Australia in 1966, our notes and coins have undergone many changes. Only our five, ten and twenty-cent coins are still minted as they were back then. The one and two-cent coins are no longer in circulation, the fifty-cent coin is a different shape, the one and two-dollar notes have been replaced by coins and our notes have changed from paper to a special type of plastic.

Coins have two sides: an *obverse* side and a *reverse* side. The obverse side of all Australian coins depicts our reigning monarch, Queen Elizabeth II, and the year in which the coin was minted. The reverse side depicts a typical Australian feature and sometimes a special commemorative event.

TABLE 1

Coin	Diameter (mm)	Mass (g)	Composition
Five-cent	19.41	2.83	75% Copper, 25% Nickel
Ten-cent	23.60	5.65	75% Copper, 25% Nickel
Twenty-cent	28.52	11.30	75% Copper, 25% Nickel
Fifty-cent	31.51	15.55	75% Copper, 25% Nickel
One-dollar	25.00	9.00	92% Copper, 6% Aluminium, 2% Nickel
Two-dollar	20.50	6.60	92% Copper, 6% Aluminium, 2% Nickel

1. What is depicted on the reverse side of each Australian coin?

Table 1 includes information on Australia's current coins in circulation. Use the table to answer questions 2–4.

2. What are the metal compositions of each of the coins?

3. Which is the heaviest coin and which is the lightest? List the coins in order from lightest to heaviest.

4. Which has the smaller diameter — the five-cent coin or the two-dollar coin? Indicate the difference in size.

TABLE 2

Note	Date of issue	Size (mm)	Average life of notes (months)	
			Plastic	**Paper**
Five-dollar	07/07/1992 24/04/1995 01/01/2001	130 × 65	40	6
Ten-dollar	01/11/1993	137 × 65	40	8
Twenty-dollar	31/10/1994	144 × 65	50	10
Fifty-dollar	04/10/1995	151 × 65	About 100	24
One-hundred-dollar	15/05/1996	158 × 65	About 450	104

Table 2 displays information on Australia's current notes in circulation. The column on the far right compares the average life of the previously used paper notes with that of the current plastic notes. Use the table to answer questions 5–9.

5. What denomination notes are available in our Australian currency?
6. On what date was Australia's first plastic note issued and what was the denomination of the note?
7. Suggest a reason for the three issue dates for the five-dollar note.
8. Why do you think each note is of a different size?
9. The table clearly shows that the plastic notes last about five times as long as the paper notes we once used. Why do you think the fifty-dollar notes last longer than the five and ten-dollar notes?

The Australian government has gone to great lengths to ensure that it is extremely difficult for the notes to be reproduced, or counterfeited. The Reserve Bank of Australia has identified eight security features. Use the RBA weblink in your eBookPLUS to answer questions 10–11.

10. Investigate the security features designed to protect our notes from being counterfeited.
11. Select any note and examine its features. Explain how you could check for the genuine nature of the note.

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Complete this digital doc: Code puzzle: What is the meaning of the NZ place name
Searchlight ID: doc-14343

Answers

Topic 18 Money

Exercise 18.2 Money

1. a. 755 cents   **b.** 305 cents   **c.** 240 cents   **d.** 900 cents

2. a. $6.85   **b.** $4.50   **c.** $0.05   **d.** $8.05

3. a. $4.75   **b.** $12.60   **c.** $159.30   **d.** $83.45

4. $81.80

5. $2.25

6. a. $33.05   **b.** $30.05   **c.** $25.05

7. 3.7 = 4 wk

8. $529.85

9. $89.90

10. $7\frac{1}{2}$ hours

11. $31; interest charges

12. $39.20

13. a. $14, $14.05   **b.** $6, $5.95

14. a. $26, $26.22   **b.** $4, $3.80 after rounding to nearest 5 cents

15. a. $51.88   **b.** $1.50   **c.** $9.63

16. Sam receives $100.20, Georgia receives $66.80.

17. 68.8%

18. 8

19. 20 days

20. a. $546.70   **b.** $5.90   **c.** $2.

21. 420 calls

Exercise 18.3 Money and percentages

1. a. $8   **b.** $10   **c.** $100   **d.** $2.40

   e. $25   **f.** $12   **g.** $4.50   **h.** $9.60

   i. $5.25   **j.** $8.70   **k.** $7.10   **l.** $24.20

   m. $24.50   **n.** $26.60   **o.** $4.20

2. a. $3.20   **b.** $2.25   **c.** $7.50   **d.** $16.70

   e. $0.15   **f.** $1.60   **g.** $2.11   **h.** $7.78

   i. $16.42

3. One, left

4. a. $2.30   **b.** $5.70   **c.** $13.00   **d.** $6.40

   e. $8.15   **f.** $1.48   **g.** $14.96   **h.** $34.59

   i. $135.45

5. a. $0.60   **b.** $1.80   **c.** $3.40   **d.** $1.20

   e. $4.50   **f.** $6.00   **g.** $2.25   **h.** $1.37

   i. $0.67   **j.** $1.68   **k.** $25.41   **l.** $11.78

6. a. $0.26   **b.** $0.42   **c.** $1.66   **d.** $4.06

   e. $16.20   **f.** $0.14   **g.** $0.07   **h.** $0.06

   i. $0.17

7. Two, left

8. a. $15   **b.** $33   **c.** $6   **d.** $1.20

   e. $0.93   **f.** $2.25   **g.** $2.97   **h.** $85.23

   i. $22.5

9. a. C   **b.** D   **c.** C   **d.** A

10. $2325

11. $6.75

12. 90c

13. $196.64

14. a. $790.91   b. $79.09

15. 63c

16. a. Yes. If he paid $10 GST then the total cost = $110 − $10 = $100 and 10% of $100 = $10, so the calculation is valid.

  b. The total price (110% of original price) is 11 times that of the GST (10% of original price), therefore if you divide the total price by 11, you will get the GST amount.

  c. $\frac{112\%}{12\%} \neq 11$

17. a. $1.40   b. 40%   c. 10%

18. a. 13.5 km   b. 50% and 50%   c. 25% and 75%

Challenge 18.1

$\frac{21}{64}$, 32.8125%

Exercise 18.4 Unitary method

1. $8.55

2. Neither is better (they are both 62 cents per 100 g).

3. a. The 325-g option is the best buy.   b. The 700-page option is the best buy.

4. a. $180   b. $30   c. $240   d. $2250

  e. $176.47   f. $422.22   g. $400   h. $350

  i. $600

5. a. $180   b. $11.40   c. $120   d. $2700

  e. $40   f. $25 800

6. a. $400   b. $640

7. $50

8. $687.50

9. $160

10. $84 600

11. a. 1.2 kg apples is the best buy.   b. 400 mL of orange juice is the best buy.

12. 500 g of cheese is the best buy.

13. $216 364

14. $48.62

15. $215.29

16. a. $54.55   b. $70.59

17. a. $21.37   b. $18.13

18. a. $218.13   b. $170.18

19. $22.20

20. Loss of $463

21. Brand B

22. $121.97

23. $(n − 3)(b + 2) = 80$

Challenge 18.2

$7.27

18.5 Review

1. a. $21.70   b. $178.35   c. $67.55

2. $76.50

3. a. $6.30   b. $4.20   c. $10.50   d. $21.60

  e. $0.35   f. $4.25   g. $11.85   h. $212.60

4. a. $0.40   b. $1.05   c. $3.20   d. $5.20

   e. $1.75   f. $2.60   g. $10.30   h. $3.85

5. a. $0.15   b. $0.30   c. $5.05   d. $27.00

   e. $48.40   f. $11.60   g. $2.95   h. $2.95

6. $1.80

7. $164.35

8. $175

9. $3792.67

10. $85

11. Estimates are total, $140; change, $10; exact amounts are $138.35, $11.65.

12. 13%

13. $1.99

14. a. $26   b. $2.58   c. $10.29   d. $8.4?

   e. $0.17   f. $9.32   g. $67.50   h. $4.32

15. $60

16. 14

17. Options are 50c per CD, 49.9c per CD, 54.17c per CD.

   Therefore the $4.99 pack is best buy.

18. First pack costs 76c per 100 g; second pack costs 66c per 100 g; so the second pack is the best buy.

19. a. Saved $40.81   b. 40.5% saved

20. $50

Investigation — Rich task

1. Five-cent, echidna; ten-cent, lyrebird; twenty-cent, platypus; fifty-cent, Coat of Arms; one-dollar, kangaroo; two-dollar, Aboriginal tribal elder

2. The five-, ten-, twenty and fifty-cent coins all contain 75% copper and 25% nickel. The one and two-dollar coins contain 92% copper, 6% aluminium and 2% nickel.

3. The fifty-cent coin is the heaviest and the five-cent coin is the lightest. The order from lightest to heaviest is: five-cent, ten-cent, two-dollar, one-dollar, twenty-cent and fifty-cent coin.

4. The five-cent diameter is the smallest diameter with a difference of 1.09 mm.

5. Five-, ten-, twenty-, fifty and one-hundred-dollar notes are available.

6. The first plastic note was issued on 7 July 1992 and was a five-dollar note. (The table does not include the commemorative ten-dollar note released as a part of Australia's bicentennial celebrations in 1988.)

7. Three different notes produced. Original 1992, new colour 1995, Federation note 2001.

8. To assist blind people in determining the denomination of each note.

9. They are not handled as often as the notes with the smaller denomination.

10–11. Teacher to check.