

norWEST
CHRISTIAN COLLEGE
STRENGTH OF PURPOSE

Questions

1. **C** Percentages (236796) **Core**

$\frac{1}{4}$ written as a percentage is:

- A. 4%
- B. 25%
- C. 40%
- D. 140%

- ## 2. **C** Percentages (237412) **Core**

In a water polo season, Vladimir had 330 shots at goal.

He scored 170 goals but missed the rest.

Vladimir's success rate of scoring goals was?

- A. less than 25%
- B. more than 25% but less than 50%
- C. more than 50% but less than 75%
- D. more than 75%

- ### 3. **C** Percentages (237414) **Core**

There were only 17 students in Grace's class on Wednesday. The other 8 were absent.

What percentage of Grace's class was absent?

- A. 8%
- B. 25%
- C. 32%
- D. 33%

- 4.
- C**
- Percentages (236818)
- Core**

Given $\frac{1}{3} = 33\frac{1}{3}\%$, then $\frac{2}{3}$ written as a percentage is:

- A. $23\frac{2}{3}\%$
B. $33\frac{2}{3}\%$
C. 66%
D. $66\frac{2}{3}\%$

5. **c** Percentages (237387) **Core**

Santana is buying a guitar string.

Some of the strings are on sale.

Select the string that will be cheapest.

Four price tags are shown, each with a different sale scenario:

- \$17 Not in the sale
- \$35 Sale: take 50% off
- \$20 Sale: take 20% off
- \$24 Sale: take 25% off

- A. B. C. D.

- 6.
- C**
- Percentages (236693)
- Core**

Which of the following lists the numbers in increasing order?

- A. 65%, 0.7, 0.72, $\frac{3}{4}$
- B. $\frac{3}{4}$, 0.7, 65%, 0.72
- C. 65%, $\frac{3}{4}$, 0.7, 0.72
- D. $\frac{3}{4}$, 0.72, 0.7, 65%

- 7.
- C**
- Percentages (236835)
- Core**

Given $\frac{1}{8} = 12.5\%$, then $\frac{5}{8}$ written as a percentage is:

- A. 25%
- B. 52.5%
- C. 58%
- D. 62.5%

8. **C** Percentages (237396) **Core**

Zoey scored 88% on her Geography exam.

If she achieved the same mark on her French exam, which of these could have been her mark?

- A. $\frac{68}{80}$
- B. $\frac{45}{50}$
- C. $\frac{40}{50}$
- D. $\frac{44}{50}$

9. **C** Percentages (236790) **Core**

Which of the following lists the numbers in decreasing order?

- A. 35% , 0.3 , 0.32 , $\frac{3}{8}$
- B. $\frac{3}{8}$, 35% , 0.32 , 0.3
- C. 35% , $\frac{3}{8}$, 0.3 , 0.32
- D. $\frac{3}{8}$, 0.32 , 0.3 , 35%

10. **B+** Percentages (237316) **Core**

Which percentage has the same value as $\frac{32}{50}$?

- A. 64%
- B. 62%
- C. 32%
- D. 16%

11. **B+** Percentages (238595) **Core**

Bec is buying 40 kilograms of dry dog food for her bullmastiff.

The table below lists the original price and the amount of discount on a 40 kilogram bag of dry dog food at four different pet stores.

40 kg Dry Dog Food Prices		
Shop	Original price	Discount
A.	\$220	18%
B.	\$245	25%
C.	\$250	$\frac{1}{5}$
D.	\$230	\$35 off

Which shop has the lowest sale price for the jeans?

12. **B+** Percentages (237321) **Core**

The table below lists the original price and the amount of discount of a pair of jeans at four different shops.

JEANS SALE		
Shop	Original price	Discount
A.	\$20	25%
B.	\$21	$\frac{1}{3}$
C.	\$18	20%
D.	\$17	\$2 off

Which shop has the lowest sale price for the jeans?

13. **A** Percentages (238683) **Core**

Which of these percentages is closest in value to $\frac{5}{9}$?

- A. 54%
- B. 55%
- C. 56%
- D. 57%

14. **A** Percentages (238687) **Core**

Which of these percentages is closest in value to $\frac{4}{7}$?

- A. 28%
- B. 47%
- C. 56%
- D. 57%

15. **A** Percentages (237423) **Core**

The population of Australian states in 2015 and 2016 is recorded in the table below.
Some data for Western Australia is not shown.

Population of Australian States			
	2015 Population	2016 Population	Percentage increases from previous year
NSW	8 026 519	8 122 315	1.2%
VIC	5 319 889	5 402 013	1.5%
QLD	3 903 444	3 959 810	1.4%
SA	1 722 033	1 737 531	0.9%
WA	2 085 021	?	0.3%
TAS	484 205	490 500	1.3%

What was the population of Western Australia (WA) close to in 2016?

- A. 2 773 100
- B. 2 710 500
- C. 2 147 600
- D. 2 091 300

16. **C** Percentages (237878) **Core**

A watch has a normal price tag of \$240.

At sale time, it is reduced by 25%.

What is the sale price of the watch? (2 marks)

17. **C** Percentages (237409) **Core**

Ricky wants to buy a cricket bat that has a normal price of \$160.

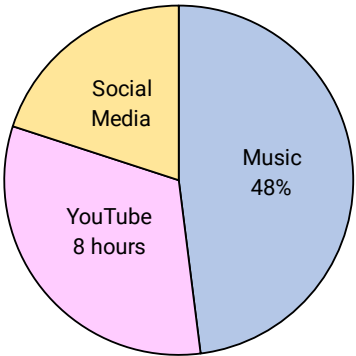
He is given a 15% discount.

What is the value of the discount? (2 marks)

18. **C** Percentages (238570) **Core**

Jye was checking his phone battery usage and found he spent his time listening to music, using social media and viewing YouTube videos.

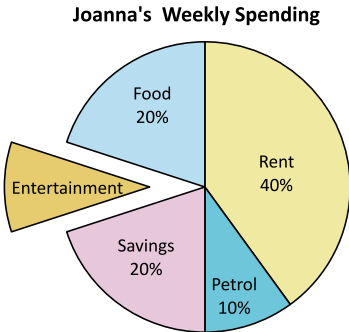
Last week he spent 25 hours in total using his phone and the pie chart below shows the breakdown of his usage.



How much time did Jye spend on social media? (2 marks)

19. **C** Percentages (237253) **Core**

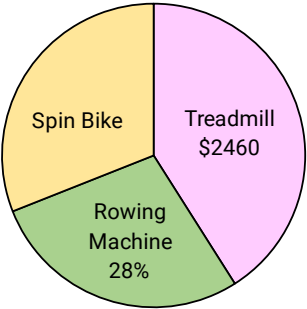
The breakdown of Joanna's weekly spending is shown in the sector graph below.



What percentage of Joanna's weekly spending was on entertainment? (2 marks)

20. **C** Percentages (238562) **Core**

Joy set up a cardio gym in her garage and purchased a treadmill, a rowing machine and a spin bike. She spent \$6000 in total and the pie chart below shows how she spent it.



How much money did Joy spend on the spin bike? (2 marks)

21. **C** Percentages (236967) **Core**

Convert the following percentages to fractions in simplest form.

- a. 89% (1 mark)
- b. 55% (1 mark)
- c. 164% (2 mark)
- d. 385% (2 marks)

22. **C** Percentages (237593) **Core**

Geordie achieved a mark of 31 out of 42 in his English essay.

Convert his mark to a percentage, correct to the nearest whole number. (2 marks)

23. **C** Percentages (237830) **Core**

John uses concrete in his landscaping business.

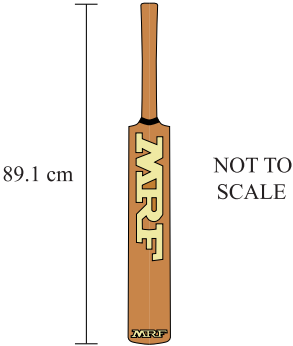


He makes a dry mix using 1 part cement, 2 parts sand and 3 parts gravel.

- a. Express the amount of gravel as a fraction of the total mix. Give your answer in simplest form. (1 mark)
- b. Express the amount of sand as a percentage of the total mix. (2 marks)
- c. Express the amount of cement compared to the total mix. Give your answer as a recurring decimal. (2 marks)

24. **C** Percentages (238602) **Core**

Sachin's cricket bat is pictured below.



The handle of the bat is 29 cm in length.

What is the length of the handle as a percentage of the total length of the bat, to the nearest whole percentage? (2 marks)

25. C Percentages (237666) Core

Graham has a bag containing coloured marbles.

There are 5 blue marbles, 4 white marbles and 6 green marbles in the bag.

- a. What percentage of the marbles in the bag are blue? Give your answer as a recurring decimal. (2 marks)
- b. Graham removed 3 blue marbles. What percentage of the remaining marbles are green? (2 marks)

26. C Percentages (236981) Core

Convert the following decimals to percentages.

- a. 0.83 (1 mark)
- b. 0.7 (1 mark)
- c. 0.03 (1 mark)
- d. 1.45 (1 marks)

27. C Percentages (236847) Core

Convert the following fractions to percentages.

- a. $\frac{51}{100}$ (1 mark)
- b. $\frac{3}{10}$ (1 mark)
- c. $1\frac{2}{5}$ (2 mark)
- d. $4\frac{3}{4}$ (2 marks)

28. B+ Percentages (237374) Core

Jake bought a mobile phone at 25% off the original price.

The original price was \$380.

How much did Jake pay for the mobile phone? (2 marks)

29. B+ Percentages (237332) Core

Albert has 50 marbles in his bag.

He records the colour of each marble in the table below.

Marble	Number of Marbles
Blue	20
Red	12
Orange	4
White	?
TOTAL	50

What percentage of the marbles are white? (2 marks)

30. B+ Percentages (237313) Core

A class of 28 students is surveyed. 21 students said they owned a mobile phone.

What percentage of the students surveyed owned a mobile phone? (2 marks)

31. B+ Percentages (237307) Core

Gary is painting his house over 3 days.

- He paints $\frac{1}{3}$ of the house on the first day.
- He paints $\frac{5}{12}$ of the house on the second day.

In order to finish, what percentage of the house does Gary need to paint on the third day? (2 marks)

32. B+ Percentages (237276) Core

Brittany is an apprentice hair dresser who works 8 hours per day.

Yesterday she spent her time in the following way.

- 0.42 of her day → sweeping and tidying the salon
- 0.18 of her day → washing hair
- 0.05 of her day → drying hair

The rest of Brittany's day was spent restocking the shelves with new products.

What percentage of Brittany's day was spent restocking shelves? (2 marks)

33. B+ Percentages (237295) Core

Find:

- a. **2% of \$14.50** (2 mark)
- b. **15% of 300 kg** (2 marks)
- c. **$12\frac{1}{2}\%$ of 880 km** (2 marks)

34. B+ Percentages (239321) Core

Jeffrey bought a new car for **\$35 000** in 2021 and sold it in 2023 for **\$21 000**.

- a. Calculate the loss that Jeffrey made. (1 mark)
- b. Calculate the percentage loss on the new car price. (2 marks)

35. B+ Percentages (239304) Core

Hendry is a salesperson who is paid **5%** commission on all sales.

Last month he sold goods to the value of **\$45 300**.

How much commission did Hendry receive last month? (2 marks)

36. B+ Percentages (237283) Core

Find:

- a. **10% of \$325** (1 mark)
- b. **30% of 1200 kg** (2 marks)
- c. **75% of 500 km** (2 marks)

37. A Percentages (237339) Core

A scholarship fund of \$1 000 000 is allocated between three scholarships as shown in the table below.

	Percentage of \$1 million
Academic Scholarship	40%
Sport Scholarship	30%
Hardship Scholarship	30%

150 students were given a Hardship Scholarship.

How much did each Hardship Scholarship winner get? (2 marks)

38. A Percentages (239333) Core

Mavis bought an original artwork as an investment. She paid **\$15 400** in 2018 and sold it in 2023 for **\$24 024**.

- a. Calculate the profit that Mavis made on her artwork. (1 mark)
- b. Calculate the percentage profit based on the original price. (2 marks)

39. A Percentages (239341) Core

Calculate the percentage profit on an item having a cost price of \$25 and a sale price of \$46.25. (2 marks)

40. A Percentages (239337) Core

Janice bakes cupcakes for the local market. The ingredients she uses in the cupcakes cost \$1.90.

Last weekend she sold the cupcakes for \$3.99 each.

- a. What was Janice's profit per cupcake? (1 mark)
- b. Calculate Janice's percentage profit based on the cost of the ingredients. (2 marks)

41. A Percentages (239346) Core

Calculate the percentage discount on an item having a cost price of \$45 and a sale price of \$30.15. (2 marks)

42. A Percentages (239339) Core

Iggy bought an e-bike for **\$3500** in 2022 and sold it in 2023 for **\$2450** to pay for an overseas holiday.

- a. Calculate the loss that Iggy made. (1 mark)
- b. Calculate the percentage loss on the original price. (2 marks)

43. A Percentages (237370) Core

A hockey stick is on sale, reduced from \$220 to \$165.

What percentage discount has been applied? (2 marks)

44. A Percentages (237354) Core

Don buys a cricket ball, originally marked \$30, that is discounted by 25%.

He also has a loyalty card that gives him another 20% off the sale price.

What is the final cost of the ball? (2 marks)

45. **A** Percentages (237361) **Core**

Michael purchases a 3D printer worth \$2 490 000.
He was given a 10% discount.
What was the price paid by Michael after the discount? *(2 marks)*

46. **A** Percentages (238678) **Core**

Mickey bought a plane ticket to London for \$1716 inclusive of 10% GST.
What was the price of the ticket before the GST was added? *(2 marks)*

47. **A** Percentages (238681) **Core**

Lancelot bought a new round table for \$2810.50 inclusive of 10% GST.
What was the price of the round table before the GST was added? *(2 marks)*

48. **A** Percentages (238674) **Core**

James purchased a pair of football boots for \$358.05.
This price included 10% GST.
What was the price of the shoes before the GST was added? *(2 marks)*

49. **A** Percentages (237358) **Core**

A box of golf balls normally cost \$19.50.
During a sale, the golf shop took 10% off the regular price of the balls.
What is the new sale price of the golf balls? *(2 marks)*

50. **A+** Percentages (237365) **Core**

Harrison was saving his money to buy a cricket bat.
After 1 month, he had saved 45% of the bat's cost.
After 2 months, he had saved another \$90 and now had 75% of the bat's cost.
How much does the bat cost? *(2 marks)*

51. **A+** Percentages (238693) **Core**

A car dealer decreases the price of a car from \$50 000 to \$45 000.
What is the percentage decrease in the price? *(2 marks)*

52. **A+** Percentages (238745) **Core**

A loaf of bread is on sale with a 15% discount.
In the last hour of trading, the bread is reduced a further 20% on the already discounted price.
What is the overall percentage discount on the bread? *(2 marks)*

53. **A+** Percentages (238730) **Core**

A farmer sells a box of oranges to a supermarket with a 15% markup.
The supermarket then adds a further 20% on the already increased price.
What is the overall percentage markup on the box of oranges? *(2 marks)*

54. **A+** Percentages (238749) **Core**

A coffee shop increases the price of a caramel latte from \$4.80 to \$6.00.
What is the percentage increase in the price? *(2 marks)*

55. **A+** Percentages (238753) **Core**

A family ticket to Taronga Zoo in Sydney reduced in price from \$90 to \$73.80.
What is the percentage decrease in the price? *(2 marks)*

Worked Solutions

1. **C** Percentages (236796) **Core**

$$\begin{aligned}\frac{1}{4} &= \left(\frac{1}{4} \times 100\right)\% \\ &= \left(\frac{100}{4}\right)\% \\ &= 25\%\end{aligned}$$

$\Rightarrow B$

2. **C** Percentages (237412) **Core**

$$\begin{aligned}\text{Success rate} &= \frac{170}{330} \\ &= 0.515\dots \\ &= 52\%\end{aligned}$$

$\therefore$ His success rate is more than 50% but less than 75%.

$\Rightarrow C$

3. **C** Percentages (237414) **Core**

$$\begin{aligned}\text{Total in class} &= 17 + 8 \\ &= 25\end{aligned}$$

$\therefore$ Percentage absent

$$\begin{aligned}&= \frac{8}{25} \times 100 \\ &= 32\%\end{aligned}$$

$\Rightarrow C$

4. **C** Percentages (236818) **Core**

$$\begin{aligned}\frac{2}{3} &= 2 \times \frac{1}{3} \\ &= \left(2 \times 33\frac{1}{3}\right)\% \\ &= 66\frac{2}{3}\%\end{aligned}$$

$\Rightarrow D$

Worked Solutions

5. **C** Percentages (237387) **Core**

Cost of each option:

A. \$17

B. \$35 less 50% = \$17.50

C. \$20 less 20% = 20 - 4 = \$16

D. \$24 less 25% = 24 - 6 = \$18

$\therefore$ Sale: take 20% off is the cheapest string.

$\Rightarrow C$

6. **C** Percentages (236693) **Core**

Convert to decimals:

$$65\% = \frac{65}{100} = 0.65$$

$$\frac{3}{4} = \frac{75}{100} = 0.75$$

$\therefore$ ascending (increasing) order is $\rightarrow 65\%, 0.7, 0.72, \frac{3}{4}$

$\Rightarrow A$

7. **C** Percentages (236835) **Core**

$$\begin{aligned}\frac{5}{8} &= 5 \times \frac{1}{8} \\ &= (5 \times 12.5)\% \\ &= 62.5\%\end{aligned}$$

$\Rightarrow D$

8. **C** Percentages (237396) **Core**

$$\begin{aligned}88\% &= \frac{88}{100} \\ &= \frac{44}{50}\end{aligned}$$

$\Rightarrow D$

9. **C** Percentages (236790) **Core**

Convert to decimals:

$$35\% = \frac{35}{100} = 0.35$$

$$\frac{3}{8} = 0.375$$

$\therefore$ descending (decreasing) order is $\rightarrow \frac{3}{8}$, 35% , 0.32 , 0.3

$\Rightarrow B$

10. **B+** Percentages (237316) **Core**

Converting to a percentage:

$$\frac{32}{50} = \frac{64}{100} = 64\%$$

$\Rightarrow A$

11. **B+** Percentages (238595) **Core**

Consider the sale price at each shop:

$$A = 220 - (18\% \times 220) = 220 - 39.60 = \$180.40$$

$$B = 245 - (25\% \times 245) = 245 - 61.25 = \$183.75$$

$$C = 250 - \left(\frac{1}{5} \times 250\right) = 250 - 50 = \$200$$

$$D = 230 - 35 = \$195$$

$\therefore$ Shop *A* has the lowest sale price.

$\Rightarrow A$

12. **B+** Percentages (237321) **Core**

Consider the sale price at each shop:

$$A = 20 - (25\% \times 20) = \$15$$

$$B = 21 - (1/3 \times 21) = \$14$$

$$C = 18 - (20\% \times 18) = \$14.40$$

$$D = 17 - 2 = \$15$$

$\Rightarrow B$

13. **A** Percentages (238683) **Core**

$$5/9 = 55.55\ldots\%$$

$$= 56\% \text{ (nearest \%)}$$

$\Rightarrow C$

14. **A** Percentages (238687) **Core**

$$4/7 = 57.14\ldots\%$$

$$= 57\% \text{ (nearest \%)}$$

$\Rightarrow D$

15. **A** Percentages (237423) **Core**

Solution 1

WA Population in 2016

$$= 2\,085\,021 + \left(\frac{0.3}{100} \times 2\,085\,021\right)$$

$$= 2\,085\,021 + 6255.063$$

$$= 2\,091\,276.063$$

$$\approx 2\,091\,300$$

Solution 2 (Advanced)

WA Population in 2016

$$= 2\,085\,021 \times 1.003$$

$$\approx 2\,091\,300$$

$\Rightarrow D$

16. **C** Percentages (237878) **Core**

Method 1

$$\text{Sale price of watch} = 240 - 240 \times 25\%$$

$$= 240 - 60$$

$$= \$180$$

Method 2 (Advanced)

$$\text{Sale price of watch} = 240 \times (100 - 25)\%$$

$$= 240 \times 75\%$$

$$= 240 \times \frac{3}{4}$$

$$= \$180$$

17. C Percentages (237409) Core

Value of the discount
 $10\% \text{ of } 160 = 16$
 $\therefore 5\% \text{ of } 160 = 8$
 $\therefore 15\% \text{ of } 160 = 16 + 8 = 24$
 $\therefore$ The value of the discount was \$24.

18. C Percentages (238570) Core

Percentage watching YouTube videos $= \frac{8}{25} \times 100$
 $= 32\%$

Percentage on social media $= 100 - (48 + 32) = 20\%$
 $\therefore \text{textAmountofusageonsocialmedia} = 20\% \times 25$
 $= 5 \text{ hours}$

19. C Percentages (237253) Core

Percentage spent on Entertainment $= 100 - (20 + 40 + 10 + 20)$
 $= 10\%$

 $\therefore$ Joanna spent 10% on Entertainment.

20. C Percentages (238562) Core

Percentage spent on the treadmill $= \frac{2460}{6000} \times 100$
 $= 41\%$

Percentage on spin bike $= 100 - (41 + 28) = 31\%$
 $\therefore \text{textAmountspentonspinbike} = 31\% \times 6000$
 $= 31 \times 60$
 $= \$1860$

21. C Percentages (236967) Core

a. $89\% = \frac{89}{100}$

b. $55\% = \frac{55}{100}$
 $= \frac{11}{20}$

c. $164\% = \frac{164}{100}$
 $= 1\frac{64}{100} = 1\frac{16}{25}$

d. $385\% = \frac{385}{100}$
 $= 3\frac{85}{100} = 3\frac{17}{20}$

22. C Percentages (237593) Core

Conversion $= \frac{31}{42} \times 100$
 $= 73.809\dots\%$
 $\approx 74\%$

23. C Percentages (237830) Core

- a. Gravel as fraction of total $= \frac{3}{6}$
 $= \frac{1}{2}$
- b. Sand as percentage of total $= \frac{2}{6} \times 100$
 $= \frac{1}{3} \times 100$
 $= 33\frac{1}{3}\%$
- c. Cement compared to total $= \frac{1}{6}$
 $= 0.16666\dots$
 $\approx 0.1\dot{6}$

24. C Percentages (238602) Core

Length of the handle as a percentage: $= \frac{29}{89.1} \times 100$
 $= 32.54\dots\%$
 $\approx 33\%$

25. C Percentages (237666) Core

- a. Total marbles $= 5 + 4 + 6 = 15$
- Percentage Blue $= \frac{5}{15} \times 100$
 $= 33.33333\dots\%$
 $= 33.\dot{3}\%$
- b. Total marbles after 3 removed $= 12$
- Percentage Green $= \frac{6}{12} \times 100$
 $= 50\%$

26. C Percentages (236981) Core

- a. $0.83 = 0.83 \times 100$
 $= 83\%$
- b. $0.7 = 0.7 \times 100$
 $= 70\%$
- c. $0.03 = 0.03 \times 100$
 $= 3\%$
- d. $1.45 = 1.45 \times 100$
 $= 145\%$

27. C Percentages (236847) Core

- a. $\frac{51}{100} = 51\%$
- b. $\frac{3}{10} = \frac{30}{100}$
 $= 30\%$
- c. $1\frac{2}{5} = 1\frac{2 \times 20}{5 \times 20}$
 $= 1\frac{40}{100} = \frac{140}{100}$
 $= 140\%$
- d. $4\frac{3}{4} = 4\frac{75}{100}$
 $= \frac{475}{100}$
 $= 475\%$

28. **B+** Percentages (237374) **Core**

Solution 1

$$\begin{aligned}\text{Price of mobile} &= 380 - (25\% \times 380) \\ &= 380 - 95 \\ &= \$285\end{aligned}$$

Solution 2 (Advanced)

$$\begin{aligned}\text{Price of mobile} &= 0.75 \times 380 \\ &= \$285\end{aligned}$$

29. **B+** Percentages (237332) **Core**

$$\begin{aligned}\text{Number of white marbles} &= 50 - (20 + 12 + 4) \\ &= 14\end{aligned}$$

$$\begin{aligned}\therefore \% \text{ white} &= \frac{14}{50} \times 100 \\ &= 28\%\end{aligned}$$

30. **B+** Percentages (237313) **Core**

$$\begin{aligned}\text{Percentage} &= \frac{21}{28} \times 100 \\ &= \frac{3}{4} \times 100 \\ &= 75\%\end{aligned}$$

31. **B+** Percentages (237307) **Core**

$$\begin{aligned}\text{Fraction painted} &= \frac{1}{3} + \frac{5}{12} \\ &= \frac{(4 + 5)}{12} \\ &= \frac{9}{12} \\ &= \frac{3}{4} \\ &= 75\%\end{aligned}$$

$\therefore$ 25% needs to be painted on the third day.

32. **B+** Percentages (237276) **Core**

$$\begin{aligned}\text{Percentage of day restocking shelves} &= 1 - (0.42 + 0.18 + 0.05) \\ &= 1 - 0.65 = 0.35 \\ &= 35\%\end{aligned}$$

$\therefore$ Brittany spent 35% of her day restocking shelves.

33. **B+** Percentages (237295) **Core**

$$\begin{aligned}\text{a. } 2\% \text{ of } \$14.50 &\rightarrow 1\% \text{ of } \$14.50 = \$0.145 \\ \therefore 2\% \text{ of } \$14.50 &= 2 \times \$0.145 \\ &= \$0.29\end{aligned}$$

$$\begin{aligned}\text{b. } 15\% \text{ of } 300 \text{ kg} \\ 10\% \text{ of } 300 \text{ kg} &= 30 \text{ kg} \\ \therefore 5\% \text{ of } 300 \text{ kg} &= 15 \text{ kg} \\ \therefore 15\% \text{ of } 300 \text{ kg} &= 30 + 15 = 45 \text{ kg}\end{aligned}$$

$$\begin{aligned}\text{c. } 12\frac{1}{2}\% \text{ of } 880 \text{ km} \\ 25\% \text{ of } 880 \text{ km} &= 220 \text{ km} \\ \therefore 12\frac{1}{2}\% \text{ of } 880 \text{ km} &= 110 \text{ km}\end{aligned}$$

34. **B+** Percentages (239321) **Core**

$$\begin{aligned}\text{a. Loss} &= 35\,000 - 21\,000 \\ &= \$14\,000\end{aligned}$$

$$\begin{aligned}\text{b. Percentage Loss} &= \frac{\text{loss}}{\text{original price}} \times 100\% \\ &= \frac{14\,000}{35\,000} \times 100\% \\ &= 40\%\end{aligned}$$

35. **B+** Percentages (239304) **Core**

$$\begin{aligned}\text{Commission} &= 5\% \times 45\,300 \\ &= \frac{5}{100} \times 45\,300 \\ &= \$2265\end{aligned}$$

$\therefore$ Hendry earned \$2265 in commission.

36. **B+** Percentages (237283) **Core**

$$\begin{aligned}\text{a. } 10\% \text{ of } \$325 &= \frac{10}{100} \times 325 \\ &= \frac{1}{10} \times 325 \\ &= \$32.50\end{aligned}$$

$$\begin{aligned}\text{b. } 30\% \text{ of } 1200 \text{ kg} &= \frac{30}{100} \times 1200 \\ &= 30 \times 12 \\ &= 360 \text{ kg}\end{aligned}$$

$$\begin{aligned}\text{c. } 75\% \text{ of } 500 &= \frac{75}{100} \times 500 \\ &= 75 \times 5 \\ &= 375 \text{ km}\end{aligned}$$

37. **A** Percentages (237339) **Core**

$$\begin{aligned}\text{Hardship Scholarship Funds} \\ &= 30\% \times 1\,000\,000 \\ &= \$300\,000\end{aligned}$$

$$\begin{aligned}\therefore \text{Amount each winner received} \\ &= \frac{300\,000}{150} \\ &= \$2000\end{aligned}$$

38. **A** Percentages (239333) **Core**

$$\begin{aligned}\text{a. Profit} &= 24\,024 - 15\,400 \\ &= \$8624\end{aligned}$$

$$\begin{aligned}\text{b. Percentage Profit} &= \frac{\text{Profit}}{\text{Original price}} \times 100\% \\ &= \frac{8624}{15\,400} \times 100\% \\ &= 56\%\end{aligned}$$

39. **A** Percentages (239341) **Core**

$$\begin{aligned}\text{Profit} &= \text{Sale Price} - \text{Cost Price} \\ &= 46.25 - 25 \\ &= \$21.25\end{aligned}$$

$$\begin{aligned}\text{Percentage Profit} &= \frac{\text{Profit}}{\text{Cost price}} \times 100\% \\ &= \frac{21.25}{25} \times 100\% \\ &= 85\%\end{aligned}$$

40. **A** Percentages (239337) **Core**

$$\begin{aligned}\text{a. Profit} &= 3.99 - 1.90 \\ &= \$2.09\end{aligned}$$

$$\begin{aligned}\text{b. Percentage Profit} &= \frac{\text{Profit}}{\text{Cost of ingredients}} \times 100\% \\ &= \frac{2.09}{1.90} \times 100\% \\ &= 110\%\end{aligned}$$

41. **A** Percentages (239346) **Core**

$$\begin{aligned}\text{Discount} &= \text{Cost Price} - \text{Sale Price} \\ &= 45 - 30.15 \\ &= \$14.85\end{aligned}$$

$$\begin{aligned}\text{Percentage Discount} &= \frac{\text{Discount}}{\text{Cost price}} \times 100\% \\ &= \frac{14.85}{45} \times 100\% \\ &= 33\%\end{aligned}$$

42. **A** Percentages (239339) **Core**

a. $\text{Loss} = 3500 - 2450$
 $= \$1050$

b. $\text{Percentage Loss} = \frac{\text{loss}}{\text{original price}} \times 100\%$
 $= \frac{1050}{3500} \times 100\%$
 $= 30\%$

43. **A** Percentages (237370) **Core**

$$\begin{aligned}\text{Discount} &= \frac{\text{reduction}}{\text{original price}} \times 100 \\ &= \frac{220 - 165}{220} \times 100 \\ &= 25\%\end{aligned}$$

44. **A** Percentages (237354) **Core**

Solution 1

$$\begin{aligned}\text{Sale price} &= 30 - (25\% \times 30) \\ &= 30 - 7.50 \\ &= \$22.50\end{aligned}$$

$$\begin{aligned}\therefore \text{Final cost} &= 22.50 - (20\% \times 22.50) \\ &= 22.50 - 4.50 \\ &= \$18\end{aligned}$$

Solution 2 (Advanced)

$$\begin{aligned}\text{Final cost} &= 30 \times 0.75 \times 0.8 \\ &= \$18\end{aligned}$$

45. **A** Percentages (237361) **Core**

Solution 1

$$\begin{aligned}\text{Discount} &= 10\% \times 2\,490\,000 \\ &= \$249\,000\end{aligned}$$

$$\begin{aligned}\therefore \text{Discounted Price} &= 2\,490\,000 - 249\,000 \\ &= \$2\,241\,000\end{aligned}$$

Solution 2 (Advanced)

$$\begin{aligned}\text{Discounted Price} &= 0.9 \times 2\,490\,000 \\ &= \$2\,241\,000\end{aligned}$$

46. **A** Percentages (238678) **Core**

Plane ticket has had 10% added to the price.

$\therefore$ \$1716 represents 110% of the original price

$$\therefore \frac{110}{100} \times \text{Original price} = \$1716$$

$$\begin{aligned}\therefore \text{Original price} &= \frac{\$1716 \times 10}{11} \\ &= \$1560\end{aligned}$$

47. **A** Percentages (238681) **Core**

Round table has had 10% added to the price.

$\therefore$ \$2810.50 represents 110% of the original price

$$\therefore \frac{110}{100} \times \text{Original price} = \$2810.50$$

$$\begin{aligned}\therefore \text{Original price} &= \frac{\$2810.50 \times 10}{11} \\ &= \$2555\end{aligned}$$

48. **A** Percentages (238674) **Core**

Football boots have had 10% added to the price.

$\therefore$ \$358.05 represents 110% of the original price

$$\therefore \frac{110}{100} \times \text{Original price} = \$358.05$$

$$\begin{aligned}\therefore \text{Original price} &= \frac{358.05 \times 10}{11} \\ &= \$325.50\end{aligned}$$

49. **A** Percentages (237358) **Core**

$$\begin{aligned}10\% \text{ discount} &= \frac{19.50}{10} \\ &= \$1.95\end{aligned}$$

$$\begin{aligned}\therefore \text{Sale price} &= \$19.50 - \$1.95 \\ &= \$17.55\end{aligned}$$

50. **A+** Percentages (237365) **Core**

$$75\% - 45\% = \$90$$

$$30\% = \$90$$

$$\therefore 1\% = \$3$$

$$\begin{aligned}\therefore \text{The bat cost} &= 100 \times 3 \\ &= \$300\end{aligned}$$

51. **A+** Percentages (238693) **Core**

$$\text{Price decrease} = 50\,000 - 45\,000 = \$5\,000$$

$$\begin{aligned}\therefore \text{Percentage Decrease} &= \frac{5\,000}{50\,000} \times 100 \\ &= 0.10 \times 100 \\ &= 10\%\end{aligned}$$

52. **A+** Percentages (238745) **Core**

Strategy 1

Assume the bread costs \$1.00.

Cost after 15% discount = \$0.85

$$\begin{aligned}\text{Cost after further 20\% discount} &= 0.85 - (20\% \times 0.85) \\ &= 0.85 - 0.17 \\ &= \$0.68\end{aligned}$$

$$\therefore \text{Overall discount} = (1.00 - 0.68) \times 100 = 32\%$$

Strategy 2

$$\begin{aligned}\text{Overall discount} &= 1 - (1 \times 0.85 \times 0.80) - 1 \\ &= 1.00 - 0.68 \\ &= 0.32 \\ &= 32\%\end{aligned}$$

53. **A+** Percentages (238730) **Core**

Strategy 1

Assume the box of oranges costs \$1.00.

Cost after 15% markup = \$1.15

$$\begin{aligned}\text{Cost after further 20\% increase} &= 1.15 + (20\% \times 1.15) \\ &= 1.15 + 0.23 \\ &= \$1.38\end{aligned}$$

$$\therefore \text{Overall markup} = (1.38 - 1.00) \times 100 = 38\%$$

Strategy 2

$$\begin{aligned}\text{Overall markup} &= (1 \times 1.15 \times 1.20) - 1 \\ &= 1.38 - 1.00 \\ &= 0.38 \\ &= 38\%\end{aligned}$$

54. **A+** Percentages (238749) **Core**

$$\text{Price increase} = 6 - 4.80 = \$1.20$$

$$\begin{aligned}\text{Percentage increase} &= \frac{1.2}{4.8} \times 100 \\ &= 0.25 \times 100 \\ &= 25\%\end{aligned}$$

55. **A+** Percentages (238753) **Core**

$$\text{Price decrease} = 90 - 73.80 = \$16.20$$

$$\begin{aligned}\text{Percentage decrease} &= \frac{16.2}{90} \times 100 \\ &= 0.18 \times 100 \\ &= 18\%\end{aligned}$$