PROFIT-LOSS-DISCOUNT

1 **(a)** **(i)** In a camera magazine, 63 pages are used for adverts.
The ratio number of pages of adverts : number of pages of reviews = 7 : 5 .

Calculate the number of pages used for reviews.

Answer(a)(i) ..... [2]

(ii) In another copy of the magazine, 56 pages are used for reviews and for photographs.
The ratio number of pages of reviews : number of pages of photographs = 9 : 5 .

Calculate the number of pages used for photographs.

Answer(a)(ii) ..... [2]

(iii) One copy of the magazine costs \$4.90 .
An annual subscription costs \$48.80 for 13 copies.

Calculate the percentage discount by having an annual subscription.

Answer(a)(iii) ..... % [3]

(b) In a car magazine, 25% of the pages are used for selling second-hand cars, $62\frac{1}{2}$% of the **remaining** pages are used for features, and the other 36 pages are used for reviews.

Work out the total number of pages in the magazine.

Answer(b) ..... [4]

MARKING SCHEME:

(a) (i)	45	**2**	**M1** for $5 \times 63 \div 7$
(ii)	20	**2**	**M1** for $5 \times 56 \div 14$
(iii)	23.4 or 23.38 to 23.41	**3**	**M2** for $\frac{13 \times 4.9 - 48.8}{13 \times 4.9} \times 100$ or $\frac{4.9 - 48.8 \div 13}{4.9} \times 100$ Or **M1** for $\frac{13 \times 4.9 - 48.8}{13 \times 4.9}$ or $\frac{48.8}{13 \times 4.9} \times 100$ or 76.6[…]
(b)	128	**4**	Using fractions (percentages / decimals): **M1** for $\frac{3}{4} \times \frac{3}{8}$ $\left[= \frac{9}{32}\right]$ or $\frac{75}{100} \times 37.5$ [= 28.125%] **A1** for $\frac{9}{32}$ or 28.125[%] **M1** for $36 \div \frac{9}{32}$ oe or $36 \times \frac{100}{28.125}$ oe Partial percentages **M1** for (Remaining) $\frac{100 \times 36}{37.5}$ [= 96] **A1** for 96 **M1** for $96 \div \frac{75}{100}$ oe **SC1** for 288

2 **(a)** In a cycling club, the number of members are in the ratio males : females = 8 : 3.
The club has 342 females.

(i) Find the total number of members.

..... [2]

(ii) Find the percentage of the total number of members that are female.

..... % [1]

(b) The price of a bicycle is $1020.
Club members receive a 15% discount on this price.

Find how much a club member pays for this bicycle.

$ ..... [2]

(c) In 2019, the membership fee of the cycling club is $79.50 .
This is 6% more than last year.

Find the **increase** in the cost of the membership.

$ ..... [3]

(d) Asif cycles a distance of 105 km.
On the first part of his journey he cycles 60 km in 2 hours 24 minutes.
On the second part of his journey he cycles 45 km at 20 km/h.

Find his average speed for the whole journey.

..... km/h [4]

(e) Bryan invested $480 in an account 4 years ago.
The account pays compound interest at a rate of 2.1% per year.
Today, he uses some of the money in this account to buy a bicycle costing $430.

Calculate how much money remains in his account.

$ ..... [3]

(f) The formula $s = \frac{1}{2}at^2$ is used to calculate the distance, s, travelled by a bicycle.

When $a = 3$ and $t = 10$, each correct to the nearest integer, calculate the lower bound of the distance, s.

..... [2]

MARKING SCHEME:

(a)(i)	1254	**2**	**M1** for $342 \div 3$
(a)(ii)	27.3 or 27.27…	**1**	
(b)	867	**2**	**M1** for $1020 \times \frac{15}{100}$ oe or $1020 \times \left(1 - \frac{15}{100}\right)$ oe
(c)	4.5[0]	**3**	**M2** for $\frac{79.5[0]}{100+6}[\times 6]$ oe or $\frac{79.5[0]}{100+6} \times 100$ oe or **M1** for 79.5[0] associated with 106[%]
(d)	22.6 or 22.58… nfww	**4**	**M1** for $\frac{45}{20}$ or better and **M2** for $\frac{60+45}{\textit{their}\ 2\text{h}\ 24\,\text{min} + \textit{their}\ \frac{45}{20}}$ or **M1** for *their* $\frac{45}{20}$ + *their* 2h 24min
(e)	91.6[0] to 91.61	**3**	**M2** for $480 \times \left(1 + \frac{2.1}{100}\right)^4 - 430$ oe OR **M1** for $480 \times \left(1 + \frac{2.1}{100}\right)^4$ oe **A1** for 522, 521.6[0] to 521.61
(f)	112.8125	**2**	**B1** for 2.5 or 9.5 seen

3 **(a)** Ali and Ben receive a sum of money.
They share it in the ratio 5 : 1.
Ali receives $2345.

Calculate the total amount.

Answer(a) $ ..... [2]

(b) Ali uses 11% of his $2345 to buy a television.

Calculate the cost of the television.

Answer(b) $ ..... [2]

(c) A different television costs $330.

(i) Ben buys one in a sale when this cost is reduced by 15%.

How much does Ben pay?

Answer(c)(i) $ ..... [2]

(ii) $330 is 12% less than the cost last year.

Calculate the cost last year.

Answer(c)(ii) $ ..... [3]

(d) Ali invests \$1500 of his share in a bank account.
The account pays compound interest at a rate of 2.3% per year.

Calculate the total amount in the account at the end of 3 years.

Answer(d) \$ ..... [3]

(e) Ali also buys a computer for \$325.
He later sells this computer for \$250.

Calculate Ali's percentage loss.

Answer(e) ..... % [3]

MARKING SCHEME:

(a)	2814 final answer	2	**M1** for 2345 ÷ 5 soi by 469 or ans = 2810
(b)	257.95 final answer	2	**M1** for 2345 × 0.11 oe or ans = 258
(c) (i)	280.5[0] final answer	2	**M1** for 330 × (1 – 0.15) oe or ans = 281
(ii)	375	3	**M2** for 330 ÷ (1 – 0.12) oe Or **M1** for 330 = (100 – 12)% oe
(d)	1605.89 or 1605.9[0]	3	**M2** for $1500 \times (1 + 0.023)^3$ oe soi by 1605.898751 or 1500 × 1.07(05…) Or **M1** for $1500 \times (1 + 0.023)^2$ oe
(e)	23.1 or 23.07 to 23.08	3	**M2** for $\frac{325 - 250}{325} \times 100$ oe Or **M1** for $\frac{325 - 250}{325}$ soi by 0.2307… 3sf or better or $\frac{250}{325} \times 100$ soi by 76.9…

4 Anna, Bobby and Carl receive a sum of money.
They share it in the ratio $12 : 7 : 8$.
Anna receives \$504.

(a) Calculate the **total** amount.

Answer(a) \$ ..... [3]

(b) **(i)** Anna uses 7% of her \$504 to pay a bill.
Calculate how much she has left.

Answer(b)(i) \$ ..... [3]

(ii) She buys a coat in a sale for \$64.68.
This was 23% less than the original price.
Calculate the original price of the coat.

Answer(b)(ii) \$ ..... [3]

(c) Bobby uses \$250 of his share to open a bank account.
This account pays compound interest at a rate of 1.6% per year.
Calculate the amount in the bank account after 3 years.
Give your answer correct to 2 decimal places.

Answer(c) \$ ..... [3]

(d) Carl buys a computer for \$288 and sells it for \$324.
Calculate his percentage profit.

Answer(d) ..... % [3]

MARKING SCHEME:

(a)	1134	**3**	**M2** for $\frac{504}{12} \times (12 + 7 + 8)$ soi by answer of 1130 or **B1** for 27 or 42 or 294 or 336 seen
(b) (i)	468.72	**3**	**M2** for $\frac{93}{100} \times 504$ oe soi by 468.7 or 469 or **M1** for $\frac{7}{100} \times 504$ (implied by 35.28)
(ii)	84	**3**	**M2** for $\frac{64.68}{77} \times 100$ or **M1** for (100 –23)% = 64.68
(c)	262.19 cao	**3**	**M2** for 250×1.016^3 oe implied by answer 262.2 or better or **M1** for 250×1.016^n oe $n > 2$ seen
(d)	12.5%	**3**	**M2** for $\frac{324 - 288}{288} \times 100$ or **M1** for $\frac{324}{288} \times 100$ (112.5) or $\frac{36}{288}$ (0.125)

5 **(a)** Last year a golf club charged $1650 for a family membership.
This year the cost increased by 12%.

Calculate the cost of a family membership this year.

Answer(a) $ ..... [2]

(b) The golf club runs a competition.
The total prize money is shared in the ratio 1st prize : 2nd prize = 9 : 5.
The 1st prize is $500 more than the 2nd prize.

(i) Calculate the total prize money for the competition.

Answer(b)(i) $ ..... [2]

(ii) What percentage of the total prize money is given as the 1st prize?

Answer(b)(ii) .....% [1]

(c) For the members of the golf club the ratio men : children = 11 : 2.
The ratio women : children = 10 : 3.

(i) Find the ratio men : women.

Answer(c)(i) ..... : ..... [2]

(ii) The golf club has 24 members who are children.

Find the total number of members.

Answer(c)(ii) ..... [3]

(d) The club shop sold a box of golf balls for $20.40 .
The shop made a profit of 20% on the cost price.

Calculate the cost price of the golf balls.

Answer(d) $ ..... [3]

MARKING SCHEME:

(a)	1848 final answer	**2**	**M1** for $1650 \times \left(1+\frac{12}{100}\right)$ oe
(b) (i)	1750	**2**	**M1** for $\frac{500}{9-5}$ [×5] or [×9] or any equation which would lead to $4x = 500$ or $4x = 2500$ or $4x = 4500$ or $4x = 7000$ when simplified
(ii)	$64\frac{2}{7}$ or 64.3 or 64.28 to 64.29	**1**	
(c) (i)	33 : 20 oe	**2**	**B1** for 33 : 6 or 20 : 6 or 5.5 oe seen or 3.33…oe seen or **M1** for two ratios with a common number of children implied by $20k$ **and** $33k$ seen, $k > 0$
(ii)	236	**3**	**M2** for $\frac{24}{2} \times 11 + \frac{24}{3} \times 10$ oe or $((3 \times 11) + (2 \times 10)) \times 24 \div 6$ or $\frac{6}{6+20+33} \times x = 24$ or **M1** for $\frac{24}{2} \times 11$ or $\frac{24}{2} \times 13$ soi or $\frac{24}{3} \times 10$ or $\frac{24}{3} \times 13$ soi oe or $24 \div 6$ soi
(d)	17[.00]	**3**	**M2** for $20.40 \div \left(1+\frac{20}{100}\right)$ oe or **M1** for (100 + 20)% oe associated with 20.40 seen