SIMPLE-COMPOUND-INTEREST

1 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 $\dfrac{504}{12} \times (12 + 7 + 8)$ soi by answer of 1130 or **B1** for 27 or 42 or 294 or 336 seen
(b) (i)	468.72	3	**M2** for $\dfrac{93}{100} \times 504$ oe soi by 468.7 or 469 or **M1** for $\dfrac{7}{100} \times 504$ (implied by 35.28)
(ii)	84	3	**M2** for $\dfrac{64.68}{77} \times 100$ 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 $\dfrac{324 - 288}{288} \times 100$ or **M1** for $\dfrac{324}{288} \times 100$ (112.5) or $\dfrac{36}{288}$ (0.125)

2 **(a)** In a sale, Jen buys a laptop for $351.55.
This price is 21% less than the price before the sale.

Calculate the price before the sale.

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

(b) Alex invests $4000 at a rate of 8% per year simple interest for 2 years.
Bob invests $4000 at a rate of 7.5% per year compound interest for 2 years.

Who receives more interest and by how much?

Answer(b) .... receives $ .... more interest. [6]

MARKING SCHEME:

(a)	445 final answer www 3	3	**M2** for $351.55 \div (1 - 0.21)$ oe or **M1** for $351.55 = (100 - 21)$ (%)
(b)	640 or 4640	2	**M1** for $4000 \times 0.08 \times 2$ oe
	4622.5 or 622.5	2	**M1** for $4000 \times (1.075)^2$ oe or $4000 \times 0.075 \, (= 300)$ **and** $(4000 + \text{their } 300) \times$ 0.075 **and** total interest = the sum of their 2 interests.
	Alex by 17.5(0) cao final answer www 6	2	**M1** for S I amount – C I amount or reverse or simple interest – compound interest or reverse

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 $\dfrac{325 - 250}{325} \times 100$ oe Or **M1** for $\dfrac{325 - 250}{325}$ soi by 0.2307… 3sf or better or $\dfrac{250}{325} \times 100$ soi by 76.9…

4 Jane and Kate share $240 in the ratio 5 : 7 .

(a) Show that Kate receives $140.

Answer(a)

[2]

(b) Jane and Kate each spend $20.

Find the new ratio Jane's remaining money : Kate's remaining money.
Give your answer in its simplest form.

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

(c) Kate invests $120 for 5 years at 4% per year simple interest.

Calculate the total amount Kate has after 5 years.

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

(d) Jane invests $80 for 3 years at 4% per year compound interest.

Calculate the total amount Jane has after 3 years.
Give your answer correct to the nearest cent.

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

(e) An investment of $200 for 2 years at 4% per year compound interest is the same as an investment of $200 for 2 years at r% per year simple interest.

Find the value of r.

Answer(e) r = ... [3]

MARKING SCHEME:

(a)	$240 \div (5 + 7) \times 7$ [=140] oe	**M2**	**M1** for $240 \div (5 + 7)$ or 240×7
(b)	2 : 3 final answer	**2**	**B1** for ratio of form $2x : 3x$ seen or **SC1** for 3 : 2
(c)	144	**3**	**M2** for $120 + \dfrac{120 \times 4 \times 5}{100}$ oe or **M1** for $\dfrac{120 \times 4 \times 5}{100}$
(d)	89.99 cao mark final answer	**3**	**B2** for 89.9[8…] shown but not spoiled or answer 90[.0..] nfww or **M1** for $80 \times \left(\dfrac{104}{100}\right)^3$ oe If **M1** spoiled by adding 80 or subtracting 80 then **SC1** for answers 169.99 or 9.99
(e)	4.08	**3**	**M2** for $\dfrac{200 \times r \times 2}{100} = 200 \times 1.04^2 - 200$ oe or **M1** for 200×1.04^2 [216.3[2]] oe **or** $\dfrac{200 \times r \times 2}{100}$ oe

5 **(a)** **(i)** Eduardo invests $640 at a rate of 2% per year compound interest.

Show that, at the end of 6 years, Eduardo has $721, correct to the nearest dollar.

Answer(a)(i)

[2]

(ii) Manuela also invests $640.
At the end of 4 years, Manuela has $721.

Find the yearly compound interest rate.

Answer(a)(ii) .... % [4]

(b) Carlos buys a motor scooter for $1200.
Each year the value of the scooter decreases by 10% of its value at the beginning of that year.

Find the value of the scooter after 3 years.

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

MARKING SCHEME:

(a)	**(i)**	640×1.02^6 oe $= 720.7\ldots$	**M1** **B1**	Must be seen
	(ii)	3.02 or 3.020 to 3.024… nfww	**4**	**M3** for $[x =] \sqrt[4]{721 \div 640}$ or better (implied by answer of 1.03[02…] or $r = 0.0302[4\ldots]$ or **M2** for $(their\ x)^4 = 721 \div 640$ or **M1** for $640 \times (their\ x)^4 = 721$ oe
(b)		874.8[0] final answer	**2**	**M1** $1200 \times (1 - 0.1)^3$ oe