NUMBERS-SET-4

1 **(a)** Write the number 25.0467

(i) correct to 1 decimal place,

..... [1]

(ii) correct to 3 significant figures,

..... [1]

(iii) correct to the nearest 10,

..... [1]

(iv) correct to the nearest 0.001,

..... [1]

(v) in standard form.

..... [1]

(b) Change

(i) 20 cm into metres,

..... m [1]

(ii) 20 m^2 into square centimetres,

..... cm^2 [1]

(iii) 18 km/h into metres per second.

.....m/s [2]

MARKSCHEME:

(a)(i)	25.0 cao	**1**	
(a)(ii)	25.0 cao	**1**	
(a)(iii)	30	**1**	
(a)(iv)	25.047	**1**	
(a)(v)	$2.50467\times10^{[1]}$	**1**	
(b)(i)	0.2[0] oe	**1**	
(b)(ii)	200 000	**1**	
(b)(iii)	5	**2**	**M1** for $\times1000\div3600$

2 Asif buys a one-year old car.
He pays \$19 975 which is 15% less than its price when it was new.

(a) Calculate the price when it was new.

\$ ..... [2]

(b) Option 1 Pay 10% of the \$19 975 and then pay \$345 per month for 5 years.

Option 2 Borrow \$19 975 and pay this back at the end of 5 years at a rate of 2.5% per year compound interest.

Asif can pay for the car using Option 1 or Option 2.

(i) Using Option 1, find how much Asif would pay in total for the car.

\$ ..... [3]

(ii) By how much is Option 2 cheaper than Option 1?

\$ ..... [4]

MARKSCHEME:

(a)	23 500	**2**	**M1** for $x \times \frac{100-15}{100} = 19975$ oe or better
(b)(i)	22697.5[0] final answer	**3**	**M1** for $19975 \times \frac{10}{100}$ soi by 1997.5 **M1** for 12×345 [$\times 5$]
(b)(ii)	97.62	**4**	**M2** for $19975\left(1+\frac{25}{100}\right)^5$ or **M1** for $19975\left(1+\frac{25}{100}\right)^n$, $n > 1$ **M1** for *their* 22 697.5 – *their* 22 599.88

3 Naomi flies non-stop from London, England, to Perth, Australia.
The flight takes 16 hours 45 minutes.
The distance is 14 498 km.

(a) Find the average speed of the plane in km/h.

..... km/h [2]

(b) The plane leaves London at 13 15.
The time in Perth is 8 hours ahead of the time in London.

Find the time in Perth when the plane lands.

..... [3]

(c) The cost, in pounds (£), of the flight is £827.75 .
The exchange rate is 1 Australian dollar = £0.55 .

Calculate the cost of the flight in Australian dollars.

..... Australian dollars [2]

MARKSCHEME:

(a)	866 or 865.5 to 865.6	**2**	**M1** for 14 498 ÷ 16.75
(b)	1400 or 2 pm	**3**	**B1** for 29h 60min or 30 h **B1** for 06 00 OR **B1** for 21 15 oe **B1** for 38h or 37h 60min OR **M1** for 13 15 + 8 + 16 45 or 13 15 + 16 45 + 8 **M1** for a correct conversion to 24 hour clock
(c)	1505 cao	**2**	**M1** for 827.75 ÷ 0.55

4 Adam and Brenda share \$560 in the ratio Adam : Brenda = 4 : 3.

(a) Show that Adam receives \$320.

[1]

(b) Adam spends 15% of his \$320 on some software.

Calculate how much Adam spends on this software.

\$ ..... [2]

(c) In a sale, Brenda buys a computer for \$179.40 .
This is 8% less than the original price.

Calculate the original price of the computer.

\$ ..... [2]

(d) Adam spends a further \$29.60 on a train ticket.
Adam and Brenda then work out how much money each of them has left.

Show that Adam has 4 times as much left as Brenda.

[3]

MARKSCHEME:

(a)	$\frac{560}{7}\times 4$ oe	**M1**	
(b)	48	**2**	**M1** for $\frac{15}{100}\times 320$ oe
(c)	195	**2**	**M1** for $x\times\frac{100-8}{100}=179.40$ oe or better
(d)	320 – *their* 48 – 29.60 = 242.40	**M1**	Clear working to 242.40
	their 240 – 179.40 = 60.60	**M1**	Clear working to 60.60
	$60.60\times 4 = 242.40$ cao	**A1**	Clear statement using 242.40 and 60.60

5 **(a)** Carla invests $600 at a rate of 1.8% per year compound interest.
Calculate the value of Carla's investment at the end of 7 years.

$ ..... [3]

(b) Dominic wants to invest his money so that it will double its value in 17 years.

Find the lowest possible rate of compound interest per year that will give Dominic this result.
Give your answer correct to 1 decimal place.

..... % [4]

(c) Each year, the population of a village is decreasing at a rate of 4% of its value at the beginning of that year.
The population is now 2120.

Find the number of complete years since the population was last greater than 2700.

..... [4]

MARKSCHEME:

(a)	679.81 or 680 or 679.8...	**3**	**M2** for $600\left(1+\frac{1.8}{100}\right)^{7}$ or **M1** for $600\left(1+\frac{1.8}{100}\right)^{k}$, $k>1$
(b)	4.2	**4**	**B3** for 4.16 or 4.161 to 4.162 or **B2** for $\sqrt[17]{2}$ oe or **M1** for $(P)\times(\ldots)^{17}=(2P)$ oe
(c)	6	**4**	**B3** for 5.92 or 5.924... OR **M3** for $n\log\left(1-\frac{4}{100}\right)=\log\left(\frac{2120}{2700}\right)$ oe or correct trials as far as 5 and 6 or good sketch indicating value between 5 and 6 or **M2** for $\left(1-\frac{4}{100}\right)^{n}=\frac{2120}{2700}$ or at least two trials with $n>2$ or sketch that could lead to solution e.g. $y=0.96^{x}$ or **M1** for $2700\left(1-\frac{4}{100}\right)^{n}=2120$ oe or at least 2 correct trials