YEAR 10 TEST — Consumer Arithmetic — NS 5.2.2 — April 2006

1. Find the simple interest earned on Emily's investment of $12 500 if it is invested for:

   (a) 5 years at 5.5% per annum — 2

   (b) 15 months at 8% per annum — 2

2. To what amount will Judy's investment of $1500 grow if it is invested at 5% per annum compounded annually for 10 years? — 3

3. Sophie's new motor bike depreciates at 18% per year each year. What will it be worth in 9 years time (answer to the nearest dollar) if it cost $18 000 new? — 3

4. Jennifer's investment of $1000 gains an amount of $595 of interest when it is invested for a number of years at 8.5% simple interest. For how long was it invested? — 3

5. For how long (in years) will Christine need to invest $10 at 10% per annum for it to **double** in value:

   (a) With simple interest? — 1

   (b) With compound interest? — 2

6. Amy has $18 000 to invest and can't decide which investment option to use. She is offered either a simple interest rate of 7.5% per annum on her investment or 6% interest compounded annually. Amy decides to invest her money for 8 years.

   (a) Calculate the simple interest on her investment — 2

   (b) To what amount would her investment grow if she uses the compound interest option? — 3

   (c) What interest would she gain with the compound interest option? — 1

   (d) What should her decision be? — 1

   Amy's bank offers to compound her investment **monthly** at the same rate of 6% pa

   (e) Will this change her decision? Explain your answer with appropriate working. — 3

7. An investment at the Baret Bank earns $2080 in interest over 4 years on an investment of $8000. What was the simple interest rate per annum? 3

8. A home theatre system depreciates at 30% each year for the first two years and then 20% a year after that. If Calleen pays $7900 for it new, what percentage of its original value remains after 10 years? 4

9. Taylor bought a new laptop costing $3600. She decided to pay it off in instalments and paid a deposit of $450 and then monthly payments of $162.75 for 2 years.

   (a) What was the balance after the deposit was paid? 1

   (b) What was the total cost to Sarah for the laptop paying by this method? 2

   (c) How much extra did she pay for the laptop? 1

10. Ilynn borrows $12 000 and repays the loan with monthly repayments of $305 over 5 years.

   (a) How much interest does Ilynn pay? 2

   (b) What would be the equivalent flat rate of interest per year for this loan? 2

11. *Khoo Kredit Kards* offers Meyvian a deal where she pays only 0.048% interest per day on the outstanding balance of her account.

   (a) What would the interest be for an outstanding balance of $2536.20 over 25 days? 2

   (b) What is the equivalent annual flat rate of interest per year? (use 365.25 days per year) 1

12. Melanie borrows $25 000 to buy an old *Morgan* sports car. She agrees to pay it back by paying $8000 at the end of the first year and each year after that until the loan is paid back in full. She is charged 10% interest per year on the balance owing on the loan before each payment.

   (a) How much does she owe on the loan after the first payment is made? 2

   (b) What does she owe after making the third payment? 2

   (c) Will she have paid it off after her fourth payment? 1

C'est fini

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Qn	Solutions	Marks	Comments+Criteria
1 (a)	$SI = 12500 \times 0.055 \times 5$ $= \$3437.50$	✓ ✓	
(b)	$SI = 12500 \times 0.08 \times \frac{15}{12}$ $= \$1250$	✓ ✓	
2	$A_{10} = 1500(1+0.05)^{10}$ $\doteq \$2443.34$ [19]	✓✓ ✓	
3	$A_9 = 18000 \times (0.82)^9$ $= \$3017.15$ [19...] $\doteq \$3017$	✓✓ ✓	
4	$I = PRN$ $\therefore N = \frac{I}{PR}$ $= \frac{595}{1000 \cdot \frac{8.5}{100}}$ $= 7$ $\therefore$ 7 years.	✓ ✓ ✓	
5	(a) With simple interest you will need 10 years (ie $10 \times 10\% = 100\%$)	✓	

Qn	Solutions	Marks	Comments+Criteria
5	(b) $A_n = 10 \cdot (1.1)^n$ and $A_n = 20$ $\therefore (1.1)^n = 2$ $1.1^8 = 2.1435$ $\therefore$ in the 8th year. Just... ie after 8 years.	✓✓	note $(1.1)^7 = 1.948...$
6.	(a) $I = PRN$ $= 18000 \times 0.075 \times 8$ $= \$10800$	✓ ✓	
	(b) $A_8 = 18000(1.06)^8$ $= 28689.265....$ $\doteq \$28689.27$	✓✓ ✓	
	(c) Interest with CI $= 10689.27$ $\doteq \$10689.27$	✓	
	(d) She gets slightly more with SInterest	✓	
	(e) $A_{96} = 18000(1.005)^{96}$ $= 29054.568...$ $\therefore$ she gets \$11054.57 interest — change her decision	✓✓ ✓	

Qn	Solutions	Marks	Comments+Criteria
7.	$I = PRN \quad \therefore R = \frac{I}{PN}$ $R = \frac{2080}{8000 \times 4} = 6\frac{1}{2}\%$	✓ ✓✓	
8.	$A_2 = 7900 \times (0.7)^2$ $= \$3871$ $A_{10} = 3871 \times (0.8)^8$ $= 649.446\ldots$ $\doteqdot \$649.45$ which is 8.2% approx	✓ ✓ ✓ ✓	
9.	(a) deposit is \$450 $\therefore$ balance is \$3150 (b) she paid \$450 $+ 24 \times \$162.75$ $= 3906$ total $= \$4356$ (c) She paid $4356 - 3600$ $= \$756$ extra	✓ ✓ ✓✓ ✓	

Qn	Solutions	Marks	Comments+Criteria
10.	(a) 60 payments of \$305 $= \$18\,300$ $\therefore$ she paid \$6300 interest. (b) $\therefore$ Flat rate $= \frac{6300}{12000 \times 5}$ $= 10.5\%$ pa	✓✓ ✓✓	
11.	(a) $I = 0.048\% \times \$2536.20 \times 25$ $= \$30.4344\ldots$ $\doteqdot \$30.43$ (b) 0.048% per day is 17.52% pa	✓✓ ✓	
12.	(a) She owes $25000 \times 1.1 - 8000$ $= 27500 - 8000$ $= \$19500$ after 1 year (b) $A_2 = 19500 \times 1.1 - 8000$ $= 13450$ $A_3 = 13450 \times 1.1 - 8000$ $= 6795$ $A_4 = 6795 \times 1.1 - 8000$ $= -525.50$ (c) yes	✓✓ ✓✓ ✓	