VCE School Assessed Coursework: SAC

Students Name:

Sacred Heart College Yarrawonga

VCE Study:	General Mathematics
Unit:	3
Outcomes:	1, 2 and 3
Assessment Task	Core SAC – Recursion and Financial Maths Part 1 Multiple Choice
Date:	Monday 27th May
Time:	5 mins reading 15 mins writing
Instructions:	Students to circle the correct answer on the answer sheet.
Conditions:	Silent, individual work
Permitted Materials:	Pens, Pencils, Ruler, Eraser, TIInspire CAS calculator, Bound Notes
Marks allocated:	10

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the room.

I understand I must not intentionally or unintentionally disclose any details on this SAC or imply what is or is not included, or in any way gain an unfair advantage for myself over other students. If I do, I understand that disciplinary action will occur and my result will be downgraded. In fairness to fellow students it is my responsibility to inform the VCE office if I am aware that information about the SAC is being passed on, or that a student has gained unfair advantage.

Student Signature: Date:

Question 1

The following recurrence relation generates a sequence of numbers.

$$T_0 = 6, \quad T_{n+1} = 3T_n$$

T_5 is equal to

A. 18
B. 216
C. 486
D. 729
E. 1458

Question 2

The value of an investment, in dollars, after n years, V_n, can be modelled by the recurrence relation shown below.

$$V_0 = 8000, \quad V_{n+1} = RV_n$$

This investment earns compound interest at the rate of 5% per annum, compounding quarterly.

What is the value of R in this recurrence relation?

A. 0.05
B. 1.005
C. 1.0125
D. 1.05
E. 1.125

Question 3

A van was purchased for $38 000.

The value of the van is depreciated each year using the reducing balance method at the rate of 8% per annum.

The value of the van, V_n, in dollars, after n years can be determined using the **recurrence relation** given by

A. $V_0 = 38000, \ V_{n+1} = V_n - 3040$

A. $V_0 = 38000, \ V_{n+1} = 0.8 \times V_n$

A. $V_0 = 38000,\ V_{n+1} = 0.92 \times V_n$

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Question 4

Georgia takes out a loan which has a nominal interest rate of 4% per annum.
The effective interest rate for Georgia's loan, when rounded to two decimal places, is

A. 4.6% per annum when charged quarterly
A. 4.7% per annum when charged monthly
A. 4.07% per annum when charged fortnightly
A. 4.09% per annum when charged weekly
A. 4.08% per annum when charged daily.

Question 5

Gabby invests $160 000 in an annuity that earns interest at the rate of 4.6% per annum.
She receives a quarterly payment from the annuity for twelve years, at which time the annuity is fully paid out.
Up until the last quarter, that payment is $4356.20.
The final payment made to Gabby is

A. $4349.96
A. $4356.14
A. $4356.20
A. $4356.26
A. $4362.44

Question 6

Teeshy borrowed $720 000 to buy a house.

For the first year, she made monthly interest-only payments on the loan of $2304. After that, the interest rate changed and Teeshy made monthly payments of $5449.26, which meant that the loan was paid off after a further 15 years.
The change in interest rate per annum on this loan is closest to

A. 0.32%
A. 0.5%
A. 1.14%
A. 1.2%
A. 3.84%

Question 7

A $24 000 perpetuity is invested for 10 years at a rate of 2.12% per annum, compounding monthly.

The amount of interest earned over 10 years is

A. $3060

B. $5088

C. $24 000

D. $26 640

E. $61 056

Use the following information to answer Questions 8 and 9

Nadia borrowed $700 000 at a rate of 3.3% per annum, compounding monthly. Her repayments are $3724 per month for 25 years.

The first four lines of the amortisation table are shown below.

Payment number	Repayment ($)	Interest ($)	Principal reduction ($)	Balance ($)
0	0.00	0.00	0.00	**700 000**
1	3724			
2	3724	1920.05	1803.95	696 397.05
3	3724	1915.09	1808.91	694 588.14

Question 8

The missing amounts in the amortisation table for payment number 1 are

A. $1925, $1799, $698 201

B. $1926, $1798, $700 000

C. $1926, $1799, $698 201

D. $1925, $1798, $700 000

E. $1925, $1799, $700 000

Question 9

The percentage of the third repayment that contributes to the principal reduction is closest to

A. 0.26%

B. 0.54%

C. 47.2%

D. 48.6%

E. 51.4%

Question 10

Nigella is saving for a house deposit.

She invests $4000 in an account earning 2.05% per annum, compounding fortnightly.

Nigella adds an additional $800 per fortnight to the account.

Every 12 months, when Nigella receives a salary increase, she increases the amount of the fortnightly deposit by $50, so that in the second year she is adding $850 per fortnight, and in the third year she is adding $900.

After three years, the balance of her investment is closest to

A. $6561

B. $8073

C. $68 586

D. $72 552

E. $176 711

SHC General Mathematics Unit 3 Recursion and Financial Maths

Answer Sheet for Multiple Choice Questions

Name:_____

*****Please circle the correct answer.**

Question					
1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E