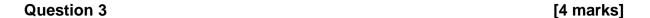


Calculate u₃.

Greenwood College Year 12 Applications Test 1 2018/2019 Resource-Free

Name)					
No calculators nor notes allowed. 25 mark total.			Formula sheet allowe 25 minute time limit	d.		
Ques	tion 1					[4 marks: 1, 3]
A num	nber se	equence is	described us	sing the rec	ursive equation:	
T _{n+1}	=	2T _n - 1	$T_3 = 5$			
(a)	Deter	mine T ₄				
(b)	Deter	mine T ₁				
Ques	tion 2					[2 marks]
A num	nber se	quence is	defined as fo	ollows:		
u _n	=	2u _{n-1} – u	I _{n-2} , U ₁ =	8 and u ₂	= 15	



A recursive sequence is defined as

$$\mathbf{u}_{n} = \boldsymbol{p}\mathbf{u}_{n-1} + \boldsymbol{q}$$

Given that $u_1 = -8$, $u_2 = 8$ and $u_3 = 4$, write down the two equations to determine the values of p and q. Do not solve for p and q.

Question 4 [5 marks: 2, 3]

A number sequence is generated by $T_n = 3n + 2$, with n = 1, 2, 3,...

(a) Express in the form $T_n = a + (n - 1) x d$

(b) Express the number sequence in recursive form.

Question 5	[4 marks: 2, 2]

For this number sequence
$$\frac{1}{2}$$
, -4, 32, -256,....

Determine the...

(a) nth term formula

(b) the recursive formula

Question 6 [4 marks: 2, 2]

The first term of a geometric progression is 4.

The fourth term is 108.

(a) Show that the ratio is 3.

(b) Write the recursive formula.

Question 7 [2 marks]

Express the geometric ratio of r = 0.76 as a % increase/decease.



(d)

Greenwood College Year 12 Applications Test 1 2018/2019 Resource-Allowed

Name					
Formu	ıla sheet, or	ne A4 page doubl	e-sided of notes a	and calculators all	lowed.
25 ma	ırk total.		25 minute time limit		
Question 8				[11 marl	ks: 2, 2, 2, 2, 3]
expec	t the car to	with a purchase posterior depreciate in valing the recursive in	alue. The value		
(a)	$T_{n+1}=0.82T_n\;,\;T_0=15\;000$ (a) Complete the table below to show the value of the car at the end of each year, to the nearest dollar.				
	n	0	1	2	3
	ue of car n years (\$)				
(b)	Describe th	ne graph if we plo	tted the value of t	he car versus the	e year.
(c)	Express th	e car values from	year to year as a	nth term formula	

Determine the value of Mary's car after 10 years, correct to the nearest dollar.

Quest	ian	0	00	-4
Wuesi	IUII	0	CO	n.

(e) Mary decided that she will sell her car at the end of the year in which its value drops below 80% of its original purchase price. After how many years should she sell the car?

Question 9 [5 marks: 2, 3]

5, x, 20,... is a number sequence.

- (a) Determine *x* if the number sequence is an arithmetic progression.
- (b) Determine *x* if the number sequence is a geometric progression.

Question 10

[5 marks: 2, 3]

	5, x, y, 78.125, is a number sequence.
(a)	Determine <i>x</i> and <i>y</i> if the number sequence is an arithmetic progression.
(b)	Determine <i>x</i> and <i>y</i> if the number sequence is a geometric progression.
Ques	tion 11 [4 marks: 2, 2]
	$T_{n+1} = 0.6T_n - 150$, $T_1 = 85$ is used to generate a number sequence.
(a)	Explain why this is neither an arithmetic progression nor a geometric progression.
(b)	T_{n+1} will become constant as n gets very large. Show how this value can be