(C1-6.1a) Name:

Homework Questions 1 – Terms of a Sequences

1. Find the next 3 terms of the following sequences and state the rule to find the next term in each case

a) 5, 9, 13, 17 — 21, 25, 29

b) 1, 3, 5, 7 — 9, 11, 13

c) 9, 13, 17, 21 — 25, 29, 33

d) -2, 6, 14, 22 — 30, 38, 46

e) 15, 22, 31, 42, 55 — 78, 87, 106

f) 4, 13, 26, 43, 64 — 89, 118, 151

g) 3, 7, 13, 21, 31 — 43, 57, 73

h) 5, 12, 21, 32, 45 — 60, 77, 96

i) 1, 2, 2, 4, 8 — 32, 256, 8192

j) 1, 3, 6, 10, 15 — 21, 28, 36

(C1-6.2a) Name:

Homework Questions 2 – Using the Nth Term of A Sequences

1. Find the value of U_1, U_2, U_3 and U_{20}

a) $U_n = 3n$ — 3, 6, 9

b) $U_n = 7n - 2$ — 5, 12, 19

c) $U_n = 2n^2$ — 2, 8, 18

d) $U_n = n^2 - 4$ — -3, 0, 5

2. A sequence is generate according to the formula $U_n=an-b$.
Given that $U_3=7$ and $U_5=13$.find the value of a and b

a=3, b=2

3. Find the value of n for which $U_n=(3n-2)^2$ has the given value of $U_n=100$

n=4

4. A sequence is generated from the formula $U_n=pn^2-q$ where p and q are constants. Given that $U_1=-1$ and $U_3=7$, find the value of the constants p and q.

p=1 q=2

5. Find the value of n for which U_n has the given value

a) $U_n=4n-1$ and $U_n=23$ — n=6

b) $U_n = \frac{2n^3 - 1}{3}$ and $U_n = 5$ — n=2

c) $U_n = 5n + 6$ and $U_n = 31$ — n=5

(C1-6.3a) Name:

Homework Questions 3 – Recursive Formula

1. Find the next 3 terms of the following sequences given both the first term and the recursive formula.

a) $U_1 = 5 \quad U_{n+1} = 3U_n$

15, 45, 135

b) $U_1 = -3 \quad U_{n+1} = 2U_n$

-6, -12, -24

c) $U_1 = 2 \quad U_{n+1} = 3U_n - 4$

-24, -76, -232

d) $U_1 = 16 \quad U_{n+1} = \frac{U_n}{4}$

4, 1, 0.25

2. By writing down the first 4 terms or otherwise, find the recursive formula that defines the following sequence.

a) $U_n=2n-1$

$U_{n+1}=U_n+2$

b) $U_n=3n-2$

$U_{n+1}=U_n+3$

3. Find the next 4 terms of these recursively defined sequences

a) $U_{n+1}=U_n-U_{n-1}$ when $U_1=6$ and $U_2=2$

6, 2, 8, 10, 18, 28

b) $U_{n+1}=3U_n+2U_{n-1}$ when $U_1=1$ and $U_2=-3$

1, -3, -7, -27, -95, -339

c) $U_{n+1}=5U_n-11$ when $U_1=3$

3, 4, 9, 34, 159

4. Write down the first 3 terms of the sequence defined by
$U_{n+1}=12-U_n$ when $U_1=10$

10, 2, 10

(C1-6.4a) Name:

Homework Questions 4 – General Term of an Arithmetic Sequence

1. Which of the following sequences are arithmetic?

a) 7, 17, 27, 37

d=10 so yes

b) 12, 5, 0, -9, -17

No

c) 24, 15, 6, -3, -12

d=-9 so yes

2. a) Find the 10^{th} term and
b) Find the formula for the nth term

a) 4, 7, 10, 13

31 $U_n=3n+1$

b) -3, -1, 1, 3

15 $U_n=2n-5$

c) 1, -4, -9, -13

-44 $U_n=-5n+6$

3. Find the 20^{th} term, if the sequence begins…

a) 2, 6, 10, 14, 18

78

b) 5, -3, -11, -19

-147

c) 21, 27.5, 34, 40.5, 47

144.5

4. Find the number of terms in the arithmetic sequence 4, 9, 14, 19……169

34

(C1-6.5a) Name:

Homework Questions 5 – Arithmetic Sequences

1. Find the number of terms in the following sequences if you are given the first few and the last term.

a) 12, 25, 38, ……..155

12

b) 198, 192, 186, 180, …….78

21

2. Find the first term of the sequence and the common difference if

a) $U_2 = 2 \quad U_5 = 17$

d=5 a=-3

b) $U_4 = -10 \quad U_8 = -6$

d=1 a=-13

3. Find the 22nd term and the nth term of the following sequences

a) 5, 11, 17, 23…..

131 $U_n=6n-1$

b) 25, 21, 17, 13….

-59 $U_n=-4n+29$

4. If the first term of an arithmetic sequence is 8 and the common difference is -5. what is the 22nd term?

-97

5. An arithmetic sequence has a first term of 15 and the 8th term is 43. What are the first four terms of the sequence?

15, 19, 23, 27

6. The first two terms of an arithmetic sequence are a+2b and 7b. Find the 3rd term.

12b-a

7. What is the common difference of the arithmetic sequence with a 6th term of -56 and an 11th term of 11?

d=9

(C1-6.6a) Name:

Homework Questions 6 – Partial sums of Arithmetic Sequences

1. Find the sum of the following series

a) 17, 25, 33, 41…(25 terms)

732

b) 15, 26, 37, 42….(15 terms)

906

c) 143, 130, 117, 104….(22 terms)

858

d) 96, 90.5, 85, 79.5…..(21 terms)

789

2. Find the sum of the following arithmetic sequences if you are given the first and the last term

a) 5, 19, 33, 47,……..243

N=18 2232

b) 271, 263, 255, 247, ……..95

N=23 4209

c) 78, 65, 52, 39, …….. -104

N=15 -195

3. After how many terms does the sum of the sequence equal the following

a) 6, 13, 20, 27 equal 1596

21

b) 18, 44, 70, 96 equal 11850

30

4. Find the 3rd term of the arithmetic sequence if the 6th term is 24 and the 15th term is 21

$a = 25\frac{2}{3}$ $d = -\frac{1}{3}$ $3rd\ term = 25$

(C1-6.7a) Name:

Homework Questions 7 – Sigma Notation

1. Rewrite the following sums using the sigma notation

a) $2 + 8 + 14 + 20 + \ldots\ldots + 74$

$$\sum_{r=1}^{r=13} 6r - 4$$

b) $96 + 89 + 82 + 75 + \ldots\ldots + 19$

$$\sum_{r=1}^{r=12} -7r + 103$$

c) Multiples of 4 less than 50

$$\sum_{r=1}^{r=12} 4r$$

d) $8 + 12 + 16 + 20 + 24$

$$\sum_{r=1}^{r=5} 4r + 4$$

2, Calculate the following

a) $\sum_{r=1}^{r=7} r^2$

140

b) $\sum_{r=1}^{r=5} 2r + 1$

35

c) $\sum_{r=1}^{r=10} r^2 - 3$

355

h) $\sum_{r=1}^{r=4} (r-6)^2$

54

3. For what values of n does $\sum_{r=1}^{n} (n^2 + 5)$ first exceed 500?

n=11

4. For what value of n would $\sum_{r=1}^{n} (25 - 6r) = 7$

n=7