UNIT 10 *Sequences* — Revision Test 10.1 (Standard)

1. Write down the next two terms of each of the following sequences:
   (a) 4, 8, 12, 16, 20, ...
   (b) 7, 10, 13, 16, 19, ...
   (c) 1, 10, 19, 28, 37, ...
   (d) 4, 10, 16, 22, 28, ...

(8 marks)

2. A sequence is defined by the formula

$$u_n = 5 + 2n$$

   (a) Calculate the first 5 terms of the sequence.
   (b) Calculate the 10th term of the sequence.

(5 marks)

3. The first 5 terms of a sequence are:

1, 2, 4, 7, 11, 16, ...

   (a) Calculate the first differences for the sequence.
   (b) Calculate the next two terms of the sequence.

(4 marks)

4. Write down the terms missing from the boxes in each of the following sequences:
   (a) 3, 6, 9, ☐, 15, 18, ☐, ...
   (b) ☐, 4, 7, 10, ☐, 16, ...
   (c) ☐, 9, 11, 13, 15, ☐, ...
   (d) ☐, 15, 21, 27, ☐, 39, ...

(8 marks)

5. Determine the 1st and 3rd terms of the sequence defined by the formula

$$u_n = 8n - 3$$

(3 marks)

6. Calculate the 7th term of the sequence defined by the formula

$$u_n = 8n + 4$$

(2 marks)

UNIT 10 *Sequences* — Revision Test 10.2 (Academic)

1. Write down the next two terms of each of the following sequences:

   (a) 7, 15, 23, 31, 39, ...

   (b) 47, 41, 35, 29, 23, ...

   (c) 18, 15, 12, 9, 6, ...

   (d) 2, 8, 18, 32, 50, ...

   (8 marks)

2. A sequence is defined by the formula

   $$u_n = 2n + 7$$

   (a) Calculate the first 4 terms of the sequence.

   (b) Calculate the 40th term of the sequence.

   (c) Calculate the 99th term of the sequence.

   (6 marks)

3. Determine the formula that generates the sequence

   3, 12, 21, 30, 39, ...

   (4 marks)

4. Determine the formula that generates the sequence

   7, 12, 17, 22, 27, ...

   (4 marks)

5. Write down the terms missing from the boxes in each of the following sequences:

   (a) $\square$, 18, 22, $\square$, 30, ...

   (b) $\square$, 3, 11, 19, $\square$, 35, ...

   (c) 98, 79, 62, $\square$, 34, $\square$, 14, ...

   (d) $\square$, 7, 9, 16, 25, $\square$, ...

   (8 marks)

UNIT 10 *Sequences* — Revision Test 10.3 (Express)

1. Write down the next two terms of each of the following sequences:

   (a) 14, 11, 8, 5, 2, ...

   (b) 1, 2, 3, 5, 8, ...

   (c) 4, 7, 12, 19, 28, ...

   (d) $\frac{4}{7}, \frac{5}{8}, \frac{2}{3}, \frac{7}{10}, \ldots$

   (8 marks)

2. Calculate the 1st and 17th terms of the sequences defined by each of the following formulae:

   (a) $u_n = 8n - 7$ (b) $u_n = 2n^2 - 3n + 3$

   (6 marks)

3. Determine the formula that generates the sequence

   5, 22, 39, 56, 73, ...

   (3 marks)

4. Determine the formulae that generate each of the following sequences:

   (a) 3, 7, 13, 21, 31, ...

   (b) 4, 19, 44, 79, 124, ...

   (10 marks)

5. What happens to the sequence

   $$u_n = \frac{2n + 6}{3n - 1}$$

   as n becomes large?

   (3 marks)

Revision Test 10.1 (Standard) Answers

1. (a) ... , 24, 28, ... B1 B1
   (b) ... , 22, 25, ... B1 B1
   (c) ... , 46, 55, ... B1 B1
   (d) ... , 34, 40, ... B1 B1 *(8 marks)*

2. (a) 7, 9, 11, 13, 15, ... (– 1 for each mistake) B3
   (b) $5 + (2 \times 10) = 25$ or $5 + 2 \times 10 = 25$ M1 A1 *(5 marks)*

3. (a) 1 2 4 7 11 16 ...
   1 2 3 4 5 M1 A1
   (b) 22, 29 M1 A1 *(4 marks)*

4. (a) 12, 21 B1 B1
   (b) 1, 13 B1 B1
   (c) 7, 17 B1 B1
   (d) 9, 33 B1 B1 *(8 marks)*

5. $8 \times 1 - 3 = 5$ M1 A1
   $8 \times 3 - 3 = 21$ A1 *(3 marks)*

6. $8 \times 7 + 4 = 60$ M1 A1 *(2 marks)*

(TOTAL MARKS 30)

Revision Test 10.2 (Academic) Answers

1.	(a) ... , 47, 55, ...		B1 B1	
	(b) ... , 17, 11, ...		B1 B1	
	(c) ... , 3, 0, ...		B1 B1	
	(d) ... , 72, 98, ...		B1 B1	*(8 marks)*
2.	(a) 9, 11, 13, 15, ...	(– 1 for each mistake)	B2	
	(b) $40 \times 2 + 7 = 87$		M1 A1	
	(c) $99 \times 2 + 7 = 205$		M1 A1	*(6 marks)*
3.	1st difference = 9		M1 A1	
	$u_n = 9n - 6$		M1 A1	*(4 marks)*
4.	1st difference = 5		M1 A1	
	$u_n = 5n + 2$		M1 A1	*(4 marks)*
5.	(a) 14, 26		B1 B1	
	(b) – 5, 27		B1 B1	
	(c) 47, 23		B1 B1	
	(d) 2, 41		B1 B1	*(8 marks)*

(TOTAL MARKS 30)

Revision Test 10.3 (Express) Answers

1. (a) ... , -1, -4, ... B1 B1

   (b) ... , 13, 21, ... B1 B1

   (c) ... , 39, 52, ... B1 B1

   (d) ... , $\frac{8}{11}$, $\frac{3}{4}$, ... B1 B1 *(8 marks)*

2. (a) 1, $8 \times 17 - 7 = 129$ B1 M1 A1

   (b) 2, $2 \times 17^2 - 3 \times 17 + 3 = 530$ B1 M1 A1 *(6 marks)*

3. Differences = 17 B1

   $u_n = 17n - 12$ M1 A1 *(3 marks)*

4. (a) 3 7 13 21 31 ...

   4 6 8 10

   2 2 2 $u_n = n^2 + ...$ M1 A1

   2, 3, 4, 5, 6, ...

   $u_n = n^2 + n + 1$ M1 A1 A1

   (b) 4 19 44 79 124 ...

   15 25 35 45

   10 10 10 $u_n = 5n^2 + ...$ M1 A1

   -1, -1, -1, -1, -1 M1 A1

   $u_n = 5n^2 - 1$ A1 *(10 marks)*

5. Tends to $\frac{2}{3}$ as n becomes large. M2 A1 *(3 marks)*

(TOTAL MARKS 30)