1. For each of the following sequences, find:
   - the next two terms
   - the term-term rule
   - the n^{th} term
   - the 50^{th} term.

a) 4, 7, 10, 13, 16 …

b) 6, 11, 16, 21, 26 …

c) 18, 16, 14, 12, 10 …

d) -13, -10, -7, -4, -1 …

e) 3.1, 2.5, 1.9, 1.3, 0.7 …

Example:
5, 7, 9, 11, 13…

5, 7, 9, 11, 13, 15, 17

term-term rule: +2

n^{th} term: 2n + 3

50^{th} term: 2 x 50 + 3 = 103

2. For each of the following n^{th} term rules, find:
   - the term-term rule
   - the first five terms
   - the 50^{th} term.

a) 2n + 5

b) 11 - 4n

c) 0.3n – 0.8

d) -10 – ½n

Example:
3n + 7

term-term rule: +3

10, 13, 16, 19, 22

50^{th} term: 3 x 50 + 7 = 157

3. For the sequences in Question 2:

a) Will any of the sequences contain the term 28?

b) Will any of the sequences contain the term -50?

Explain your reasoning and / or show your workings.

Answers

1.

a) 4, 7, 10, 13, 16, 19, 22
term-term rule: +3
n^{th} term: 3n + 1
50^{th} term: 3x50 + 1 = 151

b) 6, 11, 16, 21, 26, 31, 36
term-term rule: +5
n^{th} term: 5n + 1
50^{th} term: 5x50 + 1 = 251

c) 18, 16, 14, 12, 10, 8, 6
term-term rule: -2
n^{th} term: 20 – 2n
50^{th} term: 20 – 2x50 = -80

d) -13, -10, -7, -4, -1, 2, 5
term-term rule: +3
nth term: 3n – 16
50^{th} term: 3x50 – 16 = 134

e) 3.1, 2.5, 1.9, 1.3, 0.7, 0.1, -0.5
term-term rule: - 0.6
nth term: 3.7 – 0.6n
50^{th} term: 3.7 – 0.6x50 = -26.3

2.

a) 2n + 5
term-term rule: +2
7, 9, 11, 13, 15
50^{th} term: 2x50 + 5 = 105

b) 11 - 4n
term-term rule: -4
7, 3, -1, -5, -9
50^{th} term: 11 – 4x50 = -189

c) 0.3n – 0.8
term-term rule: +0.3
-0.5, -0.2, 0.1, 0.4, 0.7
50^{th} term: 0.3x50 – 0.8 = 14.2

d) -10 – ½n
term-term rule: -½
-10½, -11, -11½, -12, -12½
50^{th} term: -10 – ½x50 = -35

3.

a) … will any of the sequences contain the term 28?

2n + 5 = 28	11 – 4n = 28	0.3n – 0.8 = 28	-10 – ½n = 28
2n = 23	-4n = 17	0.3n = 28.8	-½n = 38
n = 11.5	n = 4.25	n = 96	n = -76

0.3n – 0.8: The 96^{th} term is 28.

b) … will any of the sequences contain the term -50?

2n + 5 = -50	11 – 4n = -50	0.3n – 0.8 = -50	-10 – ½n = -50
2n = -55	-4n = -61	0.3n = -49.2	-½n = -40
n = -27.5	n = 15.25	n = -164	n = 80

-10 – ½n: the 80^{th} term is -50.