1. Write down the next two terms in the following quadratic sequence.

$$9, \quad 13, \quad 19, \quad 27... \quad 37 \quad 49$$

4   6   8   10   12

   2   2   2   2

...... 37, 49 ...... (2)

_____

2. Write down the next two terms in the following quadratic sequence.

$$-5, \quad 0, \quad 9, \quad 22... \quad 39 \quad 60$$

5   9   13   17   21

   4   4   4   4

...... 39, 60 ...... (2)

3. The nth term of a sequence is

$$2n^2 + 4n - 1$$

Work out the 10th term of the sequence

$2(10)^2 + 4(10) - 1$

$2(100) + 40 - 1$

$200 + 40 - 1$

..239.... (2)

4. The nth term of a sequence is

$$n^2 + 2n$$

Work out the first 5 terms in the sequence

$(1)^2 + 2(1) = 3$

$(2)^2 + 2(2) = 8$

$(3)^2 + 2(3) = 15$

$(4)^2 + 2(4) = 24$

$(5)^2 + 2(5) = 35$

3, 8, 15, 24, 35 (2)

5. Work out the formula for the nth term of the quadratic sequence:

$$5, \quad 11, \quad 19, \quad 29...$$

$$6 \qquad 8 \qquad 10$$

$$2 \qquad 2$$

$$n^2 \qquad 1 \quad 4 \quad 9 \quad 16$$

$$3n+1 \quad 4 \quad 7 \quad 10 \quad 13$$

$$n^2 + 3n + 1 \quad (4)$$

6. Work out the formula for the nth term of the quadratic sequence:

$$2, \quad 10, \quad 22, \quad 38...$$

$$8 \quad 12 \quad 16$$

$$4 \quad 4$$

$$2n^2 \quad 2 \quad 8 \quad 18 \quad 32$$

$$2n-2 \quad 0 \quad 2 \quad 4 \quad 6$$

$$2n^2 + 2n - 2 \quad (4)$$

7. Work out the formula for the nth term of the quadratic sequence:

$$15, \ 19, \ 25, \ 33...$$

$$4 \quad 6 \quad 8$$
$$2 \quad 2$$
$$n^2 \quad 1 \quad 4 \quad 9 \quad 16$$
$$n+13 \quad 14 \quad 15 \quad 16 \quad 17$$

$$\underline{n^2+n+13} \ (4)$$

8. Work out the formula for the nth term of the quadratic sequence:

$$2, \ 10, \ 24, \ 44...$$

$$8 \quad 14 \quad 20$$
$$6 \quad 6$$
$$3n^2 \quad 3 \quad 12 \quad 27 \quad 48$$
$$-n \quad -1 \quad -2 \quad -3 \quad -4$$

$$\underline{3n^2-n} \ (4)$$

9. Work out the formula for the nth term of the quadratic sequence:

$$19, \ 15, \ 9, \ 1...$$

$$\quad\quad -4 \quad -6 \quad -8$$

$$\quad\quad\quad -2 \quad\quad -2$$

$$-n^2 \quad -1 \quad -4 \quad -9 \quad -16$$

$$-n+21 \quad 20 \quad 19 \quad 18 \quad 17$$

$$\underline{-n^2 -n + 21} \quad (4)$$

10. Work out the formula for the nth term of the quadratic sequence:

$$-2, \ -1, \ 1, \ 4...$$

$$\quad\quad -1 \quad 2 \quad 3$$

$$\quad\quad\quad 1 \quad\quad 1$$

$$\tfrac{1}{2}n^2 \quad \tfrac{1}{2} \quad 2 \quad \tfrac{9}{2} \quad 8$$

$$\quad\quad\quad -\tfrac{5}{2} \quad -3 \quad -\tfrac{7}{2} \quad -4$$

$$-\tfrac{1}{2}n - 2$$

$$\underline{\tfrac{1}{2}n^2 - \tfrac{1}{2}n - 2} \ (4)$$

11. A quadratic sequence starts:

$$6, \ 10, \ 16, \ 24...$$

a) Show that the nth term is $n^2 + n + 4$

$$
\begin{array}{ccccccc}
6 & & 10 & & 16 & & 24 \\
& 4 & & 6 & & 8 & \\
& & 2 & & 2 & & \\
n^2 & 1 & & 4 & & 9 & & 16 \\
n+4 & 5 & & 6 & & 7 & & 8
\end{array}
$$

$\underline{n^2 + n + 4}$ (4)

b) Hence find the term that has value 136

$$n^2 + n + 4 = 136$$

$$n^2 + n - 132 = 0$$

$$(n + 12)(n - 11) = 0$$

$$n = -12 \qquad n = 11$$

$......11^{th}......$ (2)

12. A quadratic sequence starts:

$$-8, \ 2, \ 16, \ 34...$$

a) Show that the nth term is $2n^2 + 4n - 14$

$$-8 \qquad 2 \qquad 16 \qquad 34$$
$$10 \qquad 14 \qquad 18$$
$$4 \qquad 4$$
$$2n^2 \qquad 2 \qquad 8 \qquad 18 \qquad 32$$
$$4n - 14 \qquad -10 \qquad -6 \qquad -2 \qquad 2$$

$\underline{2n^2 + 4n - 14}$ (4)

b) Hence find the term that has value 272

$$2n^2 + 4n - 14 = 272$$
$$n^2 + 2n - 7 = 136$$
$$n^2 + 2n - 143 = 0$$
$$(n + 13)(n - 11) = 0$$
$$n = -13 \qquad \underline{n = 11}$$

11th term (2)