Question 1

Express $\sqrt{3}+\sqrt{12}+\sqrt{75}$ in the form $k\sqrt{3}$, where k is an integer.

Question 2

Find the nth term of this quadratic sequence:
$-5,\ -2,\ 5,\ 16,\ 31, \ldots$

Question 1

Express $\sqrt{3}+\sqrt{12}+\sqrt{75}$ in the form $k\sqrt{3}$, where k is an integer.

$$\sqrt{3}+\sqrt{12}+\sqrt{75}$$
$$=\sqrt{3}+2\sqrt{3}+5\sqrt{3}$$
$$=8\sqrt{3}$$

Question 2

Find the nth term of this quadratic sequence:
$-5,\ -2,\ 5,\ 16,\ 31, \ldots$

The first differences are: 3, 7, 11, 15
The second differences are: 4, which means the sequence has nth term $2n^2+bn+c$

So $2n^2+bn+c$: $-5,\ -2,\ 5,\ 16,\ 31, \ldots$
And $2n^2$: $2,\ 8,\ 18,\ 32,\ 50, \ldots$

i.e. $bn+c$: $-7,\ -10,\ -13,\ -16,\ -19, ..$

so $b=-3$ and $c=-4$

So the nth term of the quadratic sequence is $2n^2-3n-4$