Question 1

Express $\sqrt{10} + \sqrt{40} + \sqrt{160}$ in the form $n\sqrt{10}$, where n is an integer.

Question 2

Find the nth term of this quadratic sequence:
$19,\ 23,\ 29,\ 37,\ 47, \ldots$

Question 1

Express $\sqrt{10} + \sqrt{40} + \sqrt{160}$ in the form $n\sqrt{10}$, where n is an integer.

$$\begin{aligned} &\sqrt{10} + \sqrt{40} + \sqrt{160} \\ &= \sqrt{10} + 2\sqrt{10} + 4\sqrt{10} \\ &= 7\sqrt{10} \end{aligned}$$

Question 2

Find the nth term of this quadratic sequence:
$19,\ 23,\ 29,\ 37,\ 47, \ldots$

The first differences are: 4, 6, 8, 10
The second differences are: 2, which means the sequence has nth term $n^2 + bn + c$

So $n^2 + bn + c$: $19,\ 23,\ 29,\ 37,\ 47, \ldots$
And n^2 : $1,\ 4,\ 9,\ 16,\ 25, \ldots$

i.e. $bn + c$: $18,\ 19,\ 20,\ 21,\ 22, ..$

so $b = 1$ and $c = 17$

So the nth term of the quadratic sequence is $n^2 + n + 17$