A3 Firstly note the factorization:

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

Since n is an integer and we're told to require $(n^3 - n^2 - n + 1)$ to be a perfect square, (i.e, the LHS of the above is a perfect square), so it must be that "$(n+1)$ too is a perfect square" (because the RHS being a perfect square must be a product of two perfect squares since we're already given or can see that $(n-1)^2$ is a perfect square).

We're also given in the problem that n lies between 200 and 250. This means that we need to find a perfect square called $(n+1)$ such that $201 < (n+1) < 251$.

Since the only perfect square available* is 225*, thus $(n+1) = 225$. or equivalently $n = 225 - 1$

or simply

$n = 224$

* Note that 225 is the only perfect square which lies between 201 and 251 because

Consecutive Squares

$$\begin{cases} 14^2 = 196 < 201 \\ 15^2 = 225 \\ 16^2 = 256 > 251 \end{cases}$$

$\boxed{\text{Answer: } 224 \text{ for } n}$