3.

Solution

Quadratic function: is a function that can be written in the form:

$s(n)=an^2+bn+c$ where a, b, and c are real numbers and $a\neq 0$

we have $s(n)=-3n^2-2n+19$, note: $-3n^2-2n+19$ is in ns-plane

Here, we know that $a=-3$, $b=-2$, $c=19$

Since $a<0$,we know that the s-coordinate of the vertex is a maximum.However,to find the s-coordinate of our vertex we first need to find the n-coordinate of the vertex by using $n=-\frac{b}{2a}=-\frac{-2}{-6}=-\frac{1}{3}$ Now that we have the n-coordinate, we can find the s-coordinate of the vertex by finding $s\left(-\frac{1}{3}\right)=-3\left(-\frac{1}{3}\right)^2-2\left(-\frac{1}{3}\right)+19=-\frac{1}{3}+\frac{2}{3}+19=\frac{58}{3}$ Maximum$=\frac{58}{3}$