10^{th} Maths - Chapter 4

This is Problem-6(v) from Exercise 4.2
A cottage industry produces a certain number of pottery articles in a day. It was observed on a particular day that the cost of production of each article (in rupees) was 3 more than twice the number of articles produced on that day. If the total cost of production on that day was ‘ 90, find the number of articles produced and the cost of each article
Given: Let the number of these articles produced in a day be = x.
Cost of each article was 3 more than twice the number of articles produced that be = 3 + 2x
total cost of the production = 90
Solution:
Given: Let the number of these articles produced in a day be = x.
Cost of each article was 3 more than twice the number of articles produced that be = 3 + 2x
total cost of the production = 90

$$
\begin{aligned}
(x)(2x+3) &= 90 && (1)\\
&= 2x^2 + 3x = 90 && (2)\\
&= 2x^2 + 3x - 90 = 0 && (3)\\
&= 2x^2 - 12x + 15x - 90 && (4)\\
&= 2x(x-6) + 15(x-6) && (5)\\
&= (2x+15)(x-6) && (6)\\
&= x = \frac{-15}{2} && (7)\\
&= or && (8)\\
&= x = 6 && (9)\\
&= 3 + 2(6) = 15 && (10)\\
&= && (11)
\end{aligned}
$$

Therefore, cost of each article = 15
Number of articles produced that day = 6