Quadratic Equations Ex 8.13 Q10

Answer :

Let marks obtained by Shefali in mathematics be x, then in english $=(30-x)$

It is given that,

$$(x+2)\times(30-x-3)=210$$
$$(x+2)\times(27-x)=210$$
$$27x-x^2+54-2x=210$$
$$-x^2+25x+54-210=0$$
$$-(x^2-25x+156)=0$$
$$x^2-25x+156=0$$
$$x^2-12x-13x+156=0$$
$$x(x-12)-13(x-12)=0$$
$$(x-12)(x-13)=0$$
$$(x-12)=0 \text{ or } (x-13)=0$$
$$x=12 \qquad x=13$$

Therefore, when $x=12$ then

$$(30-x)=(30-12)$$
$$=18$$

Hence, marks in mathematics $\boxed{x=12}$ and marks in science $\boxed{=18}$.

Or,

when $x=13$ then

$$(30-x)=(28-13)$$
$$=17$$

Hence, marks in mathematics $\boxed{x=13}$ and marks in science $\boxed{=17}$.

Quadratic Equations Ex 8.13 Q11

Answer :

Let the number of article produced by the cottage industry be x.

Then the cost of production of each article $=\text{Rs.}(2x+3)$

It is given that total cost of production $=\text{Rs. } 90$

Therefore,

$$x(2x+3)=90$$
$$2x^2+3x=90$$
$$2x^2+3x-90=0$$

$$2x^2-12x+15x-90=0$$
$$2x(x-6)+15(x-6)=0$$
$$(x-6)(2x+15)=0$$
$$(x-6)=0 \text{ or } (2x+15)=0$$
$$x=6 \qquad x=\frac{-15}{2}$$

Therefore, x cannot be negative.

So, when $x=6$ then

$$\begin{aligned}(2x+3) &= (2\times 6+3)\\ &= 12+3\\ &= 15\end{aligned}$$

Hence, the number of article produced by the cottage industry be $\boxed{x=6}$ and the cost of production of each article $\boxed{=15}$.

********** END **********