either $n-25 = 0$ or $n-30 = 0$

$\Rightarrow n = 25$ or $n = 30$

Hera, the number of toys produced in a day, will be either 25 or 30.

Let the first number be $n$ and second no. be $= 27-n$

Therefore the products of two numbers

$n(27-n) = 182$

$= n^2 - 27n - 182 = 0$

$= n^2 - 13n - 14n + 182 = 0$

$= n(n-13) - 14(n-13) = 0$

$= (n-13)(n-14) = 0$

Thus, either $n = -13 = 0$ or $n - 14 = 0$

$\Rightarrow n = 13$ or $n = 14$.

And if first number $= 14$, the second number $= 27-13 = 14$

And first no $= 14$
then second no $= 27-14 = 13$

4 Let us take two consecutive positive integers be n and n+1.

Therefore, as per the given questions

$n^2 + (n+1)^2 = 365$

$n^2 + n^2 + 1 + 2n = 365$

$2n^2 + 2n - 365 = 0$

$n^2 + n - 182 = 0$

$n^2 + 14n - 13n - 182 = 0$

$n(n+14) - 13(n+14) = 0$

$(n+14)(n-13) = 0$

5 Thus, either $n+14 = 0$ or $n - 13 = 0$

$n = -14$ or $n = 13$

Since integers are positive, so n can be 13,

$n+1 = 13 + 1 = 14$

Therefore, two consecutive positive integers will be 13 and 14

5 The base of the right triangle be n cm altitude of right triangle $(n-7)$

By Pythagoras

$\text{Base}^2 + \text{Altitude}^2 = \text{Hypotenuse}^2$

$n^2 + (n-7)^2 = 13^2$

$\Rightarrow n^2 + n^2 + 49 - 14n = 169$

$\Rightarrow 2x^2 - 14x - 120 = 0$

$\Rightarrow x^2 - 7x - 60 = 0$

$\Rightarrow x^2 - 12x + 5x - 60 = 0$

$\Rightarrow x(x-12) + 5(x-12) = 0$

$\Rightarrow (x-12)(x+5) = 0$

So either $x - 12 = 0$ or $x + 5 = 0$

$x = 12$ or $x = -5$

Since sides cannot be negative $x$ can only be 12.

Therefore the base of the given triangle is 12 cm and the altitude of this triangle will be $(12 - 7)$ cm $= 5$ cm

Q

Let us say the no of articles produced $= x$.

Therefore cost of production $= ₹(2x+3)$

Total cost $= ₹90$.

$\therefore x(2x+3) = 90$

$\Rightarrow 2x^2 + 3x - 90 = 0$

$2x^2 + 15x - 12x - 90 = 0$

$\Rightarrow x(2x+15) - 6(2x+15) = 0$

$\Rightarrow (2x+15)(x-6) = 0$

either $2x + 15 = 0$ or $x - 6 = 0$

$x = \frac{-15}{2}$ or $x = 6$

Hence no of articles produced $= 6$