(3) $x(27-x) = 182$

$\Rightarrow x^2 - 27x + 182 = 0$

$\Rightarrow x^2 - 13x - 14x + 182 = 0 \Rightarrow (x-13)(x-14)$

1st no. = 13, then

other no. = 14, other no. = 27 − 14 = 13

Therefore, the nos are 13 & 14.

(4) $x^2 + (x+1)^2 = 365$

$\Rightarrow x^2 + x^2 + 1 + 2x = 365 \Rightarrow x^2 + x - 182 = 0$

$\Rightarrow (x+14)(x-13) = 0$

~~Therefore, two cases~~

Either $x + 14 = 0$ or $x - 13 = 0$,

$x = (-14)$ or $x = 13$

Since, the integers are positive, x can only be 13.

$\therefore$, $x + 1 = 13 + 1 = 14$

Therefore, two consecutive integers will be 13 and 14.

(5) Let the base be 'x' So, altitude of the $\Delta = (x-7)$

By pythagoras theorem.

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

$\Rightarrow x^2 + x^2 + 49 - 14x = 169 \Rightarrow 2x^2 - 14x - 120 = 0$

$\Rightarrow x^2 - 7x - 60 = 0 \Rightarrow x^2 - 12x + 5x - 60 = 0$

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

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

Therefore, the base of the given Δ is 12cm

triangle will be $(12-7)$ cm

$= 5$cm.

(6) Let the number of articles be x

Price of the article $= 2x+3$

$$\frac{\text{no. of articles}}{\text{price of article}}$$

A/Q $x(2x+3) = 90$

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

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

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

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

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

$x = \frac{15}{2}, x = 6$

$\therefore$ No. of articles produced is 6.

The cost of each article $= 2x+3$

$= 2 \times 6 + 3$

$= 12 + 3$

$= ₹ 15.$