11 August, 2024 Assignment Saturday

Subject: G.Science and Ability (Math)

Q1) The sum of two numbers is 18 and the product of these two numbers is 56. What are the numbers?

Let

1st number = x

2nd number = y

According to given condition

$x + y = 18 \rightarrow (i)$

$xy = 56 \rightarrow (ii)$

$x = 18 - y \rightarrow (iii)$

Put value of x in eq (ii)

$(18-y)y = 56$

$18y - y^2 = 56$

$y^2 - 18y + 56 = 0$

$a = 1,\ b = -18,\ c = 56$

$$y = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-(-18) \pm \sqrt{(-18)^2 - 4(1)(56)}}{2(1)}$$

$$= \frac{18 \pm \sqrt{324 - 224}}{2}$$

$$y = \frac{18 \pm \sqrt{100}}{2}$$

$$y = \frac{18 \pm 10}{2}$$

$y = \frac{18+10}{2}$ | $y = \frac{18-10}{2}$

$y = \frac{28}{2}$ | $y = \frac{8}{2}$

$\boxed{y = 14}$ | $y = 4$

Put value of y in eq iii

$x = 18 - y$ | $x = 18 - y$

$x = 18 - 14$ | $x = 18 - 4$

$\boxed{x = 4}$ | $\boxed{x = 14}$

$(4, 14)$ | $(14, 4)$

S.S = $\{(4, 14), (14, 4)\}$

~~Shortcut~~

Q4) The sum of three consecutive prime number is 287. Find the square of the middle term.

Let $6x-1$, $6x+1$ and $6x'+1$ be three consecutive prime numbers.

According to the given condition

$6x-1+6x+1+6x'+1 = 287$

$18x+1 = 287$

$18x = 287-1$

$18x = 286$

$x = \frac{286}{18}$ (143)

$x = \frac{143}{9}$

$x = 15.88\ldots$

$x = 16$

$x' = 15$

~~$6x-1=6$~~

15.88..
9 | 143
9
53
45
80
72
86
72
8

$6x-1 = 6(16)-1 = 96-1 = (95)$

$6x+1 = 6(16)+1 = 96+1 = (97)$

$6x'+1 = 6(15)+1 = 90+1 = (91)$

91, (95), 97

But it is not Prime number

2nd Method

$x = 15.88\ldots$

$x = 15$

$x' = 16$

$6x-1 = 6(15)-1 = 90-1 = (89)$

$6x+1 = 6(15)+1 = 90+1 = (91)$

$6x'+1 = 6(16)+1 = 96+1 = (97)$

Three consective numbers are 89, 91, 97

Square of middle term $= (91)^2$

$= 8281$

Question: Why we can't we choose $x = 16$?