8/12/21
H.W.

Maths

16. The difference of two numbers is 3 and the difference of their squares is 69. Find the numbers.

= Let one number = x

= Second number = x + 3 (Difference of two numbers is 3)

According to the statement:

$(x+3)^2 - (x)^2 = 69$

$= (x)^2 + (3)^2 + 2 \times x \times 3 - x^2 = 64$

$= x^2 + 9 + 6x - x^2 = 69$

$= 6x = 69 - 9$

$= 6x = 60$

$= x = \frac{60}{6}$

$= x = 10$

= One no. = 10

Second number = $x + 3 = 10 + 3 = 13$

17. Two consecutive natural numbers are such that one ~~fo~~ if ^ th of the greater by 1. Find the numbers.

= Let two consecutive natural no. = $x, x+1$

∴ One fourth of the smaller = $\frac{x}{4}$

One fifth of the greater = $\frac{x+1}{5}$

According to the statement:

$\frac{x}{4} = \frac{x+1}{5} + 1 = \frac{x}{4} - \frac{x-1}{5} = 1$

$= \frac{5x - 4(x+1)}{20} = 1 = \frac{5x - 4x - 4}{20} = 1$

$= \frac{x-4}{20} = 1$

$= x - 4 = 20$ .. (Cross multiplying)

$= x = 20 + 4 \Rightarrow x = 24$

$\therefore x + 1 = 24 + 1 = 25$

Two consecutive numbers are 24 and 25.

18. Three consecutive whole numbers are such that if they be divided by 5, 3 and 4 respectively, the sum of the quotients is 40. Find the numbers.

= Let the three consecutive whole numbers be $x, x+1$ and $x+2$

According to statement:

$\frac{x}{5} + \frac{x+1}{3} + \frac{x+2}{4} = 40$

$= \frac{x}{5} \times 60 + \frac{x+1}{3} \times 60 + \frac{x+2}{4} \times 60 = 40 \times 60$

$= 12x + 20(x+1) + 15(x+2) = 2400$

$= 12x + 20x + 20 + 15x + 30 = 2400$

$= 12x + 20x + 15x = 2400 - 20 - 30$

$= 47x = 2350$

$= x = \frac{2350}{47}$

$= x = 50$

$= x + 1 = 50 + 1 = 51$

$= x + 2 = 50 + 2 = 52$

Three consecutive whole numbers are 50, 51 and 52.

19. If the same number be added to the numbers 5, 11, 15 and 31, the resulting numbers are in proportion. Find the no..

= Let x be added to each number, then the numbers

will be $5+x$, $11+x$, $15+x$ and $31+x$

According to condition-

$5+x = 15+x$

$11+x \quad 31+x$

By cross multiplication,

$(5+x)(31+x) = (15+x)(11+x)$

$= 155 + 5x + 31x + x^2 = 165 + 11x + 15x + x^2$

$= 155 + 36x + x^2 = 165 + 26x + x^2$

$= 36x + x^2 - 26x - x^2 = 165 - 155$

$= 10x = 10 \Rightarrow x = \frac{10}{10} = 1$

1 should be added.

20. The present age of a man is twice that of his son. Eight years hence, their ages will be in the ratio 7:4. Find their present ages.

= Let present age of son = x year

Then age of his father = 2x

8 years hence,

Age of son = $(x+8)$ years and age of father = $(2x+8)$ years

$= 8x + 32 = 7x + 56$

$= 8x - 7x = 56 - 32$

$= x = 24$

present age of son = 24 years

and age of father = $2x = 2 \times 24 = 48$ years

Hence age of man = 48 years and age of his son = 24 years