A, B, C

$A = \frac{1}{20}$ $B = \frac{1}{30}$ $C = \frac{1}{60}$

Numbers

Geometric progression: $x, xr, xr^3, xr^4 \ldots$

n^{th} term $= xr^{(n-1)}$

Sum of n terms $= \frac{x(1-r^n)}{(1-r)}$ $r<1$

Sum of n terms $= \frac{x(r^n-1)}{(r-1)}$ $r>1$

Arithmetic progression: $x, x+y, x+2y, x+3y \ldots$

n^{th} term $= x+(n-1)y$

Sum of n terms $= \frac{n}{2}[2x+(n-1)y]$

351 + 22.5
57.5

963
476
1439

$a^2 - b^2$

$\frac{(963)^2 - (476)^2}{(963)^2 + (476)^2}$

$1 + 2 + 3 + \cdots + n = \frac{n(n+1)}{2}$

$(1^2 + 2^2 + 3^2 + \cdots + n^2) = \frac{n(n+1)(2n+1)}{6}$

$(1^3 + 2^3 + 3^3 + \cdots + n^3 = \left[\frac{n(n+1)}{2}\right]^2$

Composite Numbers :- other than prime Numbers are called Composite Numbers.

4, 6, 8, 9, 10 - -

Co-primes :- HCF = 1 and both are Natural Numbers.

Basic formulas

$(a-b)^2 = a^2 + b^2 - 2ab$

$(a+b)^2 = a^2 + b^2 + 2ab$

$(a+b)(a-b) = a^2 - b^2$

$(a^3 + b^3) = (a+b)(a^2 + b^2 + 2ab)$

$(a+b+c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ac)$

Tricks.

1) If HCF of two Numbers are ~~Co prime~~ (1) then the Numbers are co-prime.

2) Sum of the first n odd numbers $= n^2$

3) Sum of the first n even numbers $= n(n+1)$

4) Odd numbers which are ~~not~~ divisible by 2 can be expressed as $(2n+1)$

5) Even Numbers divisible by 2 can be expresed as $2n$. other than 0 //

6) Dividend = [(Divisor x Quotient)] + Remainder

7) If Divident $= a^n + b^n$ or $a^n - b^n$

if n is even : $a^n - b^n$ is divisible by $(a+b)$
if n is odd : $a^n + b^n$ is divisible by $(a+b)$
$a^n - b^n$ is always divisible by $(a-b)$

$(4137)^{754}$

$(4137)^2 = 4137 \times 4137$

9

$3^{85} \times 6^{59} \times 7^{71}$

$= (3^1) \times (6)^3 \times (7^3)$

$= 3 \times 216 \times 343$

$216 \times 3 = 648$

648×343

4

36 × 6 = 216

7 × 7 × 7 = 49 × 7 = 343

→ 2, 6, 18, 54 ---

×3

Sum of ter.s. geometric.

81 × 3 = 243, 243 × 3 = 729

$= \frac{x(1-r^n)}{1-r}$

$= \frac{2(3^6 - 1^1)}{3-1}$

$= \frac{2(729-1)}{2}$

$= 728$

3, 6, 12, 24 - - - 384

n^{th} term

$384 = (x r^{n-1})$

$384 = 3 \times 2^{n-1}$

$\frac{384}{128} = 2^{n-1}$

$\frac{384}{6} = 64$

$\frac{128}{2} = 1$

$n-1$

$64 \times n - 1 = 1$

$64n - 64 = 1$

$64n = 65$

$n = \frac{65}{64}$

$128 = 2^{n-1}$

$2^7 = 2^{n-1}$

$2^7 =$

$7 = n-1$

$8 = n$

→ $6 + 12 + 18 + 24 - - = 1800$

$$\boxed{n^{th} = x + (n-1)y}$$

Sum of n numbers =

1800 =

Sum of n terms = $\frac{n}{2}[2x + (n-1)y]$

$1800 = \frac{n}{2}[2 \times 6 + (n-1) \times 6]$

$3600 = n[12 + 6n - 6]$

$= n[6n + 6]$

$= 6n^2 + 6n$

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$3600 = 6n^2 + 6n$

$\frac{3600}{6} = n^2 + n$

$600 = n^2 + n$

$n^2 + n - 600 = 0.$

$n^2 + 25n - 24n - 600$ (600: 25, 24)

Find the 4 digit largest num divisible 88.

9999 / 88

9999 - 55 = 9944

$1 + 2 + 3 + \dots + 50 = ?$

→

$Sum\ n = \frac{n}{2}[2x + (n-1)d]$

$= \frac{50}{2}[2 \times 1 + (49) 1]$

$= 25(2 + 49)$

$= 25 \times 51$

51 × 25 = 1275

88) 9999 (113
88
119
88
319
264
55

divisible by 4 (0) true.

935421 × 625

29 56
8 x

$\frac{56 \times 8}{29}$

$x = 5 \times y + 3$

$x^2 = (5y + 3)^2$

$x^2 = 25y^2 + 30y + 9$

$= 5(5y^2 + 6y + 4)$

4 //

$x = (56 \times y) + 29$

~~8 + 7y~~

$(8 \times 7)y + (8 \times 3) + 5$

= 5 //

$x+y=31 \quad xy=240.$

$$x-y = \sqrt{(x+y)^2-4xy}$$
$$x-y = \sqrt{(31)^2-4\times240}$$
$$= \sqrt{961-960}$$
$$= \sqrt{1}$$
$$\boxed{x-y=1}$$

31 × 31 = 961

~~0+r~~ ~~n+(n+1)+(n+2)~~

n+1) $x+(x+2)+(x+4)$

$x^2+(x+2)^2+(x+4)^2$

$x^2+x^2+4x+4+x^2+8x+16$

$= 3x^2+12x+20.$

$2531 =$

$2511 = 3(x^2+4x)$

$\frac{2511}{3} = x^2+4x$

$x^2+4x-837=0$

31 × 27

$\boxed{x=27}$

131
131
131
393
× 2
786
138
924

$x^2+y^2+z^2$

$x^2+y^2+b^2+2(ab+bc+ca)$

$138+2(131+131+131)$

$=138+2(393$

$138+$

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$x^2 + 4^2 + x^2 = 924$

$(x+4+2)^2 = 400$

$x+4+2 = 20$

$5x = \frac{x^2}{24}$

$x^2 - 5x =$

$5^x \times 5^{x^2}$

$\frac{n+(n+2)+(n+4)}{3} = 18$

$n+(n+2)+(n+4) = 54$

$n+n+3n+6 = 54$

$5(n+2) = 54$

$n+2 = 27$

$3n = 48$

$n = \frac{48}{3}$ (16)

$n = 16$

15
16
18
20.

$5^x = \frac{x^2}{24}$

$x^2 \times 24$

$14 = \frac{60}{14}$ (4)

$15 = \frac{60}{15}$

$x + 11 = \frac{60}{x}$

$x^2 + 11x = 60$

$x^2 + 11x - 60 = 0$

$x^2 + 15x - 4x - 60 = 0$

$(x+15)(x-4)$

$x = -4$

$\cdot -60x$

$15x \quad -4x$

$A \times B = \frac{3}{49}$

$3B \times B = \frac{3}{49}$

$3B^2 = \frac{3}{49}$

$B^2 = \frac{3}{49} \times \frac{1}{3}$

$B^2 = \frac{1}{49}$

$\frac{1}{7}$

$\frac{1}{7} \times 3$

$= \frac{3}{7}$

$xy = 30$

$$\frac{(x+2)+(y-2)}{3} = \frac{2}{3}$$

$$\frac{a+2}{b-2} = \frac{2}{3}$$

$3a - 2b = -10$

$a + b = 30$

$3(a+2) = 2(b-2)$

$3a + 6 = 2b - 4$

$3a - 2b = -10$

$3a - 2b + 10 = 0$

$3a - 2b = -10$

$2a + 2b = 60$

$5a = 50$

$a = 10$

$a + b$

$10 + 2$

$b = 3a - 2b = -10$

$= 30 - 2b = -10$

$= 40$ $\quad 2b = 20$

$10x + 40 = 8x + 48$

$2x = 8$

$x = 4$

$\frac{x}{x+2}$

$\frac{x+4}{x+6} = \frac{8}{10}$

$\frac{x}{4} - \frac{4}{x} = \frac{17}{72}$

$\frac{x^2 - 4^2}{xy} = \frac{17}{72}$

$\frac{xy - 4x}{0} = \frac{17xy}{72}$ $\quad 17xy$

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$7+16+25+34+\ldots+97 = ?$ $\quad \frac{97}{9}$

$= \frac{n}{2}[2x+(n-1)4]$

$= \frac{n}{2}[2\cdot 7+(n-1)9]$

$= \frac{n}{2}$

$x+y \qquad x-y = 4x.$

$x^2-y^2 = \qquad x-y = \sqrt{\ldots}$

xy