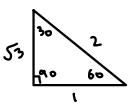
↳ Compound Interest → Amount $= P\left(1+\frac{R}{100}\right)^t$

↳ 5% annually compounded quaterly, now $R = R/4$

$t = t \times 4$

→ 30, 60, 90 Triangle

$1 : \sqrt{3} : 2$



↳ Multiples, difference between 2 multiples is also a multiple.

Eg → If K, K+200, K+350 are multiples of P, what is P

$P \rightarrow K \rightarrow K+200 \rightarrow K+350$

200, 150

These both should be multiples of P

→ Trapezoid area $= \frac{b_1+b_2}{2} \cdot h$

→ Prime number trick, to test if any no. less than 100 is a prime, check if it is divisible by any prime numbers less than 10

→ Factors of large numbers trick

↳ ① Prime factorization

↳ ② List all exponents of prime factors

↳ ③ add 1 to each

↳ ④ Multiply them

Eg → 8400 → $2^4 \times 3^1 \times 5^2 \times 7^1$

→ {4, 1, 2, 1}

→ {5, 2, 3, 2}

→ $5 \times 2 \times 3 \times 2 \rightarrow \underline{60}$

Eg → 21600 → 216×100

→ $6^3 \times 10^2$

→ $(2\times3)^3 \times (5\times2)^2$

→ $2^3 \times 3^3 \times 5^2 \times 2^2$

→ $2^5 \times 3^3 \times 5^2$

→ (5, 3, 2) → (6, 4, 3)

→ $6 \times 4 \times 3 \rightarrow \underline{72}$

↳ Inequality as absolute value

→ Express $-3 \leq x \leq 11$ as absolute inequality

→ Take midpoint $\frac{-3+11}{2} = 4$

→ $|x-4| \leq (11-4)$ {right value}

→ $|x-4| \leq 7$

→ $|-x+4| > 2$

$-x+4 > 2$

$-x+4 < -2$

$|-x| \geq 6$

$-x \geq 6$ $\quad -x \leq -6$

$x \leq -6$ $\quad x \geq 6$

→ Sum of angles in n sided polygon

$(n-2) \times 180$

→ Diagonals of an n sided polygon

$\frac{n(n-3)}{2}$

↳ Double matrix

	Type A	Type B	
Type 1	a	b	a+b
Type 2	c	d	c+d
	a+c	b+d	a+b+c+d

→ Sum of integers in a range → $\frac{n}{2}(a_1 + a_n)$

n → no. of terms → $a_n - (a_1 + 1)$

Example → blw 45 & 155

a_1 = 45, a_n = 155

$n = 155 - (45 + 1)$

→ Sum of multiples in a range → No. of terms = N

a_1 → begining of range

a_N → last number in range

→ $(a_1 + a_N) \times \frac{N}{2}$

Examples → Sum of multiples of 5 bigger than 100 & less than 200.

→ So $a_1 = 105$

$a_n = 195$

$N = \frac{195 - 105}{5} + 1 \rightarrow 19$

$(195 + 105) \times \frac{19}{2}$

$= 2850$

→ Unit digit of 57^{123}

→ only see $7^1 \rightarrow 7$

$7^2 \rightarrow \ldots 9$

$7^3 \rightarrow \ldots 3$

$7^4 \rightarrow \ldots 1$ } Pattern

$7^5 \rightarrow \ldots 7$

$7^6 \rightarrow \ldots 9$

$7^7 \rightarrow \ldots 3$

$7^8 \rightarrow \ldots 1$

→ Repeats every 4, $123 \% 4 \rightarrow 3$, check third no. in pattern = 3

→ Triangle side property

Sum of either 2 sides must be greater than the third side

$a + b > c$

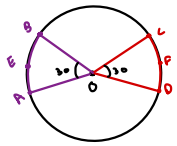
$b + c > a$

$a + c > b$

→ Set of n items with b identical items

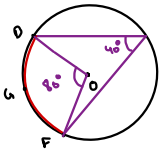
$N = \frac{n!}{b!}$

→ Equal arcs and chords



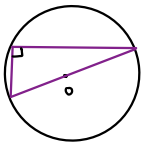
If $\angle AOB = \angle COD$, then arc AEB = arc CFD

→ Arc and incribed angle (angle which doesnt fall on centre ABC)



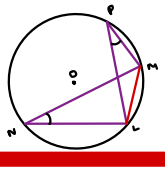
angle of arc will be 80°, double of incribed angle

→ Right angle



This has to be 90°

→ 2 incribed angles and same arc / chord



These angles are equal

→ Arc length proportion

$$\frac{\text{arc length}}{2\pi r} = \frac{\text{angle}}{360}$$

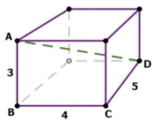
→ Area of a sector proportion

$$\frac{\text{area of sector}}{\pi r^2} = \frac{\text{angle}}{360}$$

→ Cylinder

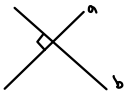
Volume = $\pi r^2 h$

Area = $2\pi r^2 + 2\pi rh$



$AD^2 = AB^2 + BC^2 + CD^2$

→ Slope of 1 lies lines



if slope of $a = m$

slope of $b = -\frac{1}{m}$

Inter Quartile Range

IQR → $Q_3 - Q_1$

→ Distance blw points (x, y) & (a, b)

$$\sqrt{(x-a)^2 + (y-b)^2}$$

→ Standard deviation →

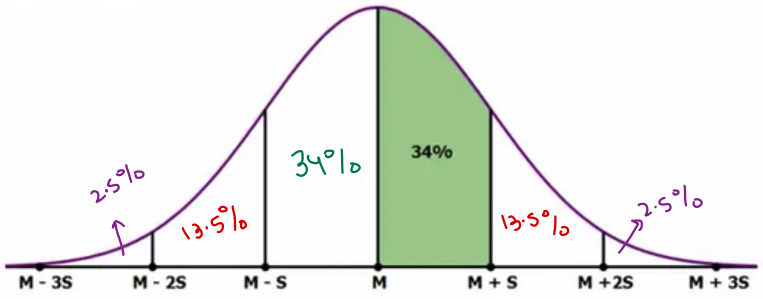
① Calc mean

② Subtract all values from mean

③ Square all values

④ Find mean of this new set → Variance

⑤ Square root variance → SD



→ Divisors = Factors

→ Parallelogram Area
= base × height

Surface area of box
= $2(wl + hl + hw)$

→ Nonnegative → positive OR zero

→ Proportionality
→ Directly $a = kb$
→ Inversly $a = \frac{k}{b}$

→ 92.645
9 → tens
2 → ones
6 → tenths
4 → hundredths } ths
5 → thousanths

→ 1 percentile of x
=
1 % of x

→ For how many integer value is
$f(x) = \frac{\sqrt{x-2}}{x}$ undefined

when $x = 0$
$x = 1$
$x = -1, -2, -3, \ldots, -\infty$
INFINITE VALUES

→ if $\frac{a}{b} > \frac{c}{d}$

then $\frac{a}{b} - \frac{c}{d} > 0$ is true

but $ad > cb$ is not always true since any of those could be negative and requeire sign change

→ 5 is how many fifths of 10
• fifth of → $\frac{x}{5}$

$\frac{x}{5} \times 10 = 5$

$x = 2.5$

→ $7.58\overline{3}$ in fraction
→ $7.58 + 0.00\overline{3}$
→ $\frac{758}{100} + 0.\overline{3} \times 0.01$
→ $\frac{758}{100} + \left(\frac{1}{3}\right)\left(\frac{1}{100}\right)$
→ $\frac{758}{100} + \frac{1}{300} \rightarrow \frac{2275}{300}$
→ $\frac{91}{12}$

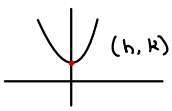
→ Standard Deviation
• Set of all positive numbes
→ multiply all numbers with $\frac{1}{2}$ ↓ SD
→ Smallest no. increased to be median ↓SD
→ Smallest no. increased to becom largest ↓SD ↑SD
→ Largest number is doubled ↑SD

→ Probability Question
"at least" → 1−x

↳ P(A or B) = P(A) + P(B) − P(A and B) {not mutualy exclusive}
↳ P(A or B) = P(A) + P(B) {for disjoint / mutually exclusive}
↳ P(A and B) = P(A) · P(B) {for independent}

→ Equation of Parabola

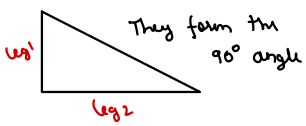
$y = a(x-h)^2 + k$



$y = x^2 + 1$ ∪
$y = -x^2 + 1$ ∩

→ Rhombus = 11[ll]ogram with 4 equal sides
→ Square = Largest rhombus of a given size

→ Standard deviation
A: 10, 20, 30, 40, 50 } Dis of 10
B: 10, 30, 50, 70, 90 } Dis of 20

B has a higher SD

→ legs of a right triangle