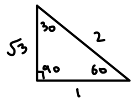
↳ Compound Interest → Amount $= P\left(1+\frac{R}{100}\right)^t$

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

$t = t \times 4$

→ 30, 60, 90 Triangle

1 : √3 : 2



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

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

$P \to K \to K+200 \to K+350$

$\underbrace{\underbrace{K \to K+200}_{200} \quad \underbrace{K+200 \to K+350}_{150}}$

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}

→ 5×2×3×2 → $\underline{\underline{60}}$

Eg → 21600 → 216 × 100

→ $6^3 \times 10^2$

→ $(2\times3)^3 \times (5\times2)^2$

→ $2^3\times3^3\times5^2\times2^2$

→ $2^5\times3^3\times5^2$

→ (5, 3, 2) → (6, 4, 3)

→ 6×4×3 → $\underline{\underline{72}}$

↳ Inequality as absolute value

→ Express $\boxed{-3 \le x \le 11}$ as absolute inequality

→ Take midpoint $\frac{-3+11}{2} = 4$

→ $|x-4| \le (11-4)$ {right value}

→ $|x-4| \le 7$

→ $|-K+4| > 2$ → $-K+4 > 2$ / $-K+4 < -2$

$|-x| \ge 6$

$-x \ge 6$ $-x \le -6$

$x \le -6$ $x \ge 6$

→ Sum of angles in n sided polygon

$(n-2) \times 180$

→ Diagonals of an n sided polygon

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

↳ Double matrix

	TypeA	TypeB	
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 → b/w 45 & 155

$45 \downarrow a_1$, $155 \downarrow a_n$

$n = 155 - (45 + 1)$

→ 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 $a_1 = 105$

$a_n = 195$

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

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

$= 2850$

→ Unit digit of 57^{123}

→ only see $7^1 \to 7$

$7^2 \to \ldots 9$

$7^3 \to \ldots 3$

$7^4 \to \ldots 1$

Pattern

$7^5 \to \ldots 7$

$7^6 \to \ldots 9$

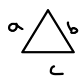
$7^7 \to \ldots 3$

$7^8 \to \ldots 1$

→ Repeats every 4 , $123 \% 4 \to 3$,

Check third no. in pattern = $\underline{\underline{3}}$

→ Triangle side property



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

$a + b > c$

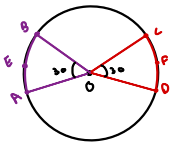
$b + c > a$

$a + c > b$

→ Set of n items with b identical items

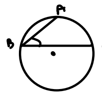
$N = \frac{n!}{b!}$

→ Equal arcs and chords

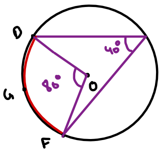


If ∠AOB = ∠COD , then arc AEB = arc CFD

→ Arc and incribed angle (angle wich doesnt fall on centre

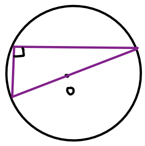


ABC)



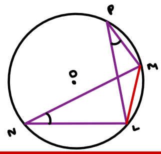
angle of arc will be 80°, double of incribed angle

→ Right angle



This has to be 90°

→ 2 incribed angles and same arc / chord



These angles are equal

→ Arc length proportion

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

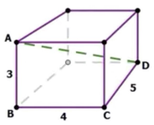
→ Area of a sector proportion

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

→ Cylinder

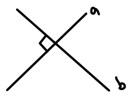
Volume = $\pi r^2 h$

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



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

→ Slope of ⊥lar lines



if slope of a = m

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

Inter Quartile Range

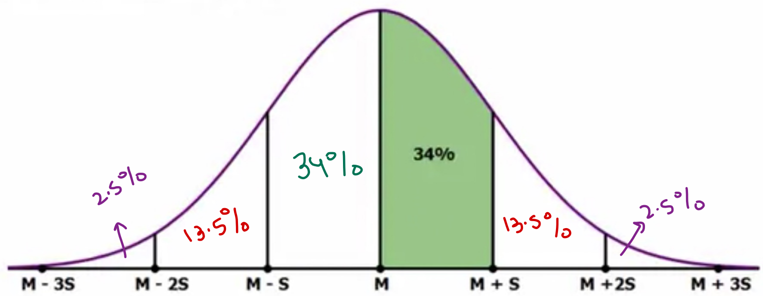
IQR → $Q_3 - Q_1$

→ Distance b/w points (x, y) & (a, b)

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

→ Standard deviation →

1. Calc mean
2. Substract 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)

→ 92.645
9 → tens
2 → ones
6 → tenths
4 → hundredths
5 → thousandths
$\}$ ths

→ 1 percentile of x
=
1 % of x

→ Nonnegative → Positive OR zero

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

→ 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 these could be negative and require sign change

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

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

$x = 2.5$

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

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

→ Probability Question
"at least" → $1 - x$

↳ $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ {not mutualy exclusive}
↳ $P(A \text{ or } B) = P(A) + P(B)$ {for disjoint / mutually exclusive}
↳ $P(A \text{ and } B) = P(A) \cdot P(B)$ {for independent}

→ Rhombus = ∥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