Maths formula sheet ☺ ★ read before exams

maths

simple interest

$= \frac{PRT}{100}$

compound interest

$\text{Total} = P\left(1 + \frac{r}{100}\right)^n$

semi-annually (six months)

$n = 2XT$, $r = P/2$

quarterly (four months)

$n = 4XT$, $r = P/4$

monthly

$n = 12XT$, $r = r/12$

★

Quadratic formula

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

unit conversion

km/h ⟷ m/s

÷ 3.6 (km/h → m/s)

× 3.6 (m/s → km/h)

similar figures formulas

$$\frac{h_1}{h_2} = \frac{l_1}{l_2}$$

$$\frac{V_1}{V_2} = \left(\frac{(l_1)^3}{(l_2)^3}\right)$$

$$\sqrt[3]{\frac{V_1}{V_2}} = \frac{l_1}{l_2}$$

$$\frac{A_1}{A_2} = \left(\frac{(l_1)^2}{(l_2)^2}\right)$$

$$\sqrt{\frac{A_1}{A_2}} = \frac{l_1}{l_2}$$

Indices:

common ones forgotten

$$x^{\frac{m}{n}} = \sqrt[n]{x^m}$$

$$x^{-\frac{a}{b}} = \frac{1}{x^{\frac{a}{b}}} = \frac{1}{\sqrt[b]{x^a}}$$

coordinate geometry

$$\text{gradient} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\text{length of line} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\text{eqn of line} = y = mx + c$$

polygons

sum of interior angles $= (n-2) \times 180°$

each interior angle $= \frac{(n-2) \times 180°}{n}$

sum of exterior angles of any polygon $= \frac{360°}{n}$ (can exterior + an interior $= 180°$)

pentagon	5
hexagon	6
octagon	8
Decagon	10

Arc length, sector and segment

In degrees

Arc length $= \frac{\theta}{360} \times 2\pi r$

Area of a sector $= \frac{\theta}{360} \times \pi r^2$

mensuration

circles ○

Area $= \pi r^2$

circumference $= 2\pi r$ / πd

In radian

Arc length $= r\theta$

Area of a sector $= \frac{1}{2} r^2 \theta$

Area of triangle $= \frac{1}{2} ab \sin C$

Trapezium

perimeter = add all sides

area $= \frac{1}{2} \times (a + b) \times h$

Parallelogram

opposite sides equal

Perimeter $= 2 \times y + 2 \times x$

area $= y \times z$

Cylinder

volume $= \pi \times r^2 \times h$

Total surface area (closed) $= 2\pi r^2$ (top + bottom circle) $+ 2\pi rh$ (curved side)

Total surface area (open) $= \pi r^2$ (bottom circle) $+ 2\pi rh$ (curved side)

Cone

Total surface area $= \pi rl + \pi r^2$ (l → slant height)

volume $= \frac{1}{2}\pi r^2 h$ (h → height)

Pyramid

Total surface areas = sum of all surface areas

volume $= \frac{1}{3} \times A \times h$

↳ base area can be △, □, ▭

Sphere

Total surface area $= 4\pi r^2$

volume $= \frac{4}{3}\pi r^3$

Hemisphere

Total SA $= 2\pi r^2 + \pi r^2$

volume $= \frac{2}{3}\pi r^3$

Trigonometry

$\tan = \frac{opp}{adj}$ TOA CAH SOH

$\cos = \frac{adj}{hyp}$

$\sin = \frac{opp}{hyp}$

PT → $a^2 = b^2 + c^2$

$\frac{1}{2}ab\sin C$ (triangle)

$\frac{a}{\sin A} = \frac{b}{\sin B}$ | $\frac{\sin A}{a} = \frac{\sin B}{B}$

cosine rule $= c^2 = a^2 + b^2 - 2ab \times \cos C$

Congrience + similarity

↓	↓
① SSS	① AA
② AAS	② SSS
③ SAS	③ SAS
④ RHS	

similarity

$$= \frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta ADC} = \left(\frac{BC}{DE}\right)^2$$

S → ratios

same height

$$= \frac{\text{area of } \Delta ABC}{\text{area of } \Delta ADC}$$

$$= \frac{\frac{1}{2} \times BC \times h}{\frac{1}{2} \times CD \times h} = \frac{BC}{CD}$$

Data and Probability

$$P = \frac{\text{no. of sucessful outcomes}}{\text{Total possible outcomes}}$$

$$IQR = Q_3 - Q_1$$

range = max. − min.

number patterns

n^{th} term =

Difference −/+ zero term

term that shld come ~~before~~ first ore.