**IGCSE QUICK REVISION**

**Standard form:**

a × 10n

* Where a one digit.
* And n +ve

-ve

**Simple Interest:**

 I = $\frac{RPT}{100}$

Where I : Interest.

 P: Amount of Money.

 T: Time Yearly.

 R: Rate.

**Compound Interest:**

 T = P(1+R/100)n

 T: Total Amount of Money.

 P: Amount of Money.

 R: Rate.

n: Time Yearly.

|  |  |  |
| --- | --- | --- |
| Shape | Area | Perimeter |
| Rec | L x W | 2(L + W) |
| Square | L x W | 4 L |
| Parallel | B x h | Sum of side |
| Trap | 1/2 (a + b)h | Sum of side |
| Kite | 1/2 D1 x D2 | Sum of side |
| Triangle | 1/2 B x h1/2 a x b x sin t | Sum of side |
| Circle | Π r2 | 2π r |



**In a right angle triangle**

* SOH/ CAH/ TOA
* b2 = a2 + c2 (Pythagoras Therom)

**Parallel lines**

* Two alternate equal angles.
* Two corresponding equal angles.
* Two interior angles are equal to 180.

**In Circle**

* radius ┴ tangent
* 2 circular angle equal
* Central angle = 2 circles
* 2 tangent are equal
* Angle opposite Diameter = 90º
* In cyclic opposite angle = 180º
* Arc length = $\frac{G}{360} x 2πr$
* Sector area = $\frac{G}{360} x πr^{2}$

Volume = A x h

A = Base area.

Sum of interior = (n-2)180

Each angle in regular = $\frac{(n-2)180}{n}$

Sum of exterior = 360º

**In similarity**

* Angles equal
* Sides proportional (equal ratio)
* $\frac{A\_{1}}{A\_{2}}=(\frac{S\_{1}}{S\_{2}})^{2}$
* $\frac{V\_{1}}{V\_{2}}=(\frac{S\_{1}}{S\_{2}})^{3}$

**Direct Variation**

 x $∝$ y x = k y

**Inversely Variation**

 x $∝$ $\frac{1}{y}$ x = $\frac{k}{y}$

**Indices**

 an x am = a n+m

 an ÷ am = a n-m

 (an)m = anm

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

 $a^{zero}$ = 1

 $a^{-1}= \frac{1}{a}$

**Inequality**

 -x < y x > -y

**Linear programming**

* Shade unrequired region after:-
* Turn inequality equation. (make y subject)
* Draw equation of (straight line).
* Shade over or under the line.

**Bearing:**

 Angle measured

* From ● North ● Clock Wise

**Sine rule:**

Given angle & opposite side

 $\frac{a}{\sin(A)}= \frac{b}{\sin(B)}= \frac{c}{\sin(C)}$

**Cosine rule:**

Given 3 sides or 2 sides and angle in bet.

a2 = b2 + c2 – 2bc cos A

cos A = $\frac{b^{2}+ c^{2}- a^{2}}{2bc}$

**Limits of Accuracy:**

nearest ÷ 2 result ±

**Quadratic Equation:**

Correct to 2 decimal place use

X = $\frac{-b\pm \sqrt{b^{2}-4ac}}{2a}$ where ax2 + bx + c = 0

**Gradient:**

* Line touches the curve at point
* Tan angle.
* Diff of y / diff of x

Equation of straight line y = mx + c

Where m = gradient , c = y intercept

**Graphical soln:**

* Point of intersection of curve with x axis or line
* Line cut x axis y = 0
* Line cut y axis x = 0

**In a speed time graph:**

 Distance = Area under graph.

 Acceleration = $\frac{change of speed}{change of time}$

**Sets:**

 A ∩ B Ā complement A ∪ B

 1 ∈ A not A all element

 1 ∈ B A ∁ δ

 B ∁ ε

**In Vector:**

* If you want resultant you must start with point and end by the other.

For example: $\vec{AB}= \vec{AC}+ \vec{CD}+ \vec{DB}$

**Column Vector:**

 $\left(\genfrac{}{}{0pt}{}{3}{2}\right)=\vec{AB}$

 Start with A 3 unit in +ve x

 Then 2 unit in +ve y

**Parallel Vector:**

 k$\left(\genfrac{}{}{0pt}{}{a}{b}\right) //$ $\left(\genfrac{}{}{0pt}{}{a}{b}\right)$

**Modulus Vector:**

 • Length • magnitude

 If $\vec{a}= \left(\genfrac{}{}{0pt}{}{x}{y}\right)$ $\left|a\right|= \sqrt{x^{2}+y^{2}}$

**Function:**

* To get the inverse make x subject.
* Composed function substitute x by function.

**Matrix:**

 Order R x C

 M1 x M2

 For multiply R1 x C1 R2 x C2

 Condition C1 = R2

**Inverse of matrix:**

 A = $\left(\begin{matrix}a&b\\c&d\end{matrix}\right)$

 A-1 = $\frac{1}{ad-bc} \left(\begin{matrix}d&-b\\-c&a\end{matrix}\right)$

 AA-1 = I $\left(\begin{matrix}1&0\\0&1\end{matrix}\right)$

 I Identity

**Transformation:**

 G1 the size not change

* Reflection Distance from O to Mir = Distance from I to Mir

 OI ┴ Mir

* Rotation center (┴ Bisector of O & I)

 Angle of rotation

 Direction

* Translation $\left(\genfrac{}{}{0pt}{}{x}{y}\right)$ column vector

G2 the size changed (scale factor)

**Enlargement**

* Scale factor
* Center fenelayment

Scale Factor = $\frac{lenght of I}{length of O}$

**Shear**

* Scale factor
* Invariant line

Scale Factor = $\frac{Dist of I moved }{┴ dist of O from Inv}$

**Stretch**

* Scale factor
* Invariant line

Scale Factor = $\frac{┴ dist of I from Inv }{┴ dist of O from Inv}$

**Statistics**

* If histogram f.d = $\frac{freq}{class width}$
* If pie chart total frequency $≡360°$

 Data

Ungrouped grouped

Mean $≡ \frac{sum of all}{their no}$ $\frac{\sum\_{}^{}fx}{\sum\_{}^{}f}$ Middle class

Median Middle after arrange $^{f}/\_{2}$ and add till you get

Mode Most repeated highest frequency class

In cumulative frequency curve:

Median = 50% of frequency

Upper quartile = 75% of frequency

Lower quartile = 25% of frequency

Inter quartile = upper – lower

**Probability**

 $0\leq P \leq 1$

 P = $\frac{no of events}{all events}$

Sum of all probability = 1

For 2 events A & B

P (A and B) = P (A) x P (B)

P (A or B) = P (A) + P (B)

If we have 2 points A (x1, y1) B(x2, y2)

 A B

Length of $\overline{AB}$ = $\sqrt{(x\_{2}- x\_{1})^{2}+ (y\_{2}- y\_{1})^{2}}$

Mid-point = ( $\frac{x\_{1}+x\_{2}}{2}, \frac{y\_{1}+y\_{2}}{2}$)

Grad = $\frac{y\_{2}-y\_{1}}{x\_{2}-x\_{1}}$