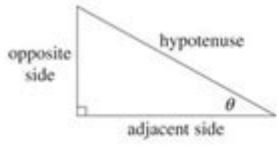# Hsc General Maths Formula Sheet

## Trigonometric Ratios



$$\sin\theta = \frac{\text{opposite side}}{\text{hypotenuse}}$$

$$\cos\theta = \frac{\text{adjacent side}}{\text{hypotenuse}}$$

$$\tan\theta = \frac{\text{opposite side}}{\text{adjacent side}}$$

### Sine rule

In $\triangle ABC$,

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

### Area of a triangle

In $\triangle ABC$,

$$A = \frac{1}{2}ab\sin C$$

### Cosine rule

In $\triangle ABC$,

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

or

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

## Units of Memory and File Size

$1 \text{ byte} = 8 \text{ bits}$

$1 \text{ kilobyte} = 2^{10} \text{ bytes} = 1024 \text{ bytes}$

$1 \text{ megabyte} = 2^{20} \text{ bytes} = 1024 \text{ kilobytes}$

$1 \text{ gigabyte} = 2^{30} \text{ bytes} = 1024 \text{ megabytes}$

$1 \text{ terabyte} = 2^{40} \text{ bytes} = 1024 \text{ gigabytes}$

## Blood Alcohol Content Estimates

$$BAC_{male} = \frac{10N - 7.5H}{6.8M}$$

or

$$BAC_{female} = \frac{10N - 7.5H}{5.5M}$$

$N$ is number of standard drinks consumed

$H$ is number of hours of drinking

$M$ is person's mass in kilograms

## Distance, Speed and Time

$$D = ST, \quad S = \frac{D}{T}, \quad T = \frac{D}{S}$$

$$\text{average speed} = \frac{\text{total distance travelled}}{\text{total time taken}}$$

$$\text{stopping distance} = \left\{\begin{array}{c}\text{reaction-time}\\\text{distance}\end{array}\right\} + \left\{\begin{array}{c}\text{braking}\\\text{distance}\end{array}\right\}$$

## Probability of an Event

The probability of an event where outcomes are equally likely is given by:

$$P(\text{event}) = \frac{\text{number of favourable outcomes}}{\text{total number of outcomes}}$$

## Straight Lines

### Gradient

$$m = \frac{\text{vertical change in position}}{\text{horizontal change in position}}$$

### Gradient–intercept form

$$y = mx + b$$

$m$ is gradient

$b$ is y-intercept

HSC General Maths Formula Sheet is an essential tool for students preparing for their Higher School Certificate examinations in New South Wales, Australia. This formula sheet serves as a quick reference guide, helping students recall vital mathematical concepts and formulas that are crucial for solving problems across various topics in the syllabus. In this article, we will explore the importance of the HSC General Maths formula sheet, key topics covered, and provide a comprehensive overview of the formulas students should know.

# Importance of the HSC General Maths Formula Sheet

The HSC General Maths formula sheet plays a significant role in a student's preparation and performance in the examination. Here are some reasons why it is important:

1. Quick Reference: During exams, time management is critical. A formula sheet allows students to quickly reference formulas without wasting precious minutes trying to recall them from memory.

2. Comprehensive Coverage: The formula sheet encompasses all key topics, ensuring that students have all the necessary tools at their fingertips.

3. Study Aid: It can serve as an effective study tool, helping students to memorize and understand the application of various formulas.

4. Confidence Booster: Familiarity with the formulas can boost a student's confidence, which is vital when tackling challenging exam questions.

5. Error Reduction: Having access to the correct formulas can reduce errors in calculations, leading to better outcomes in exams.

# Key Topics in HSC General Maths

The HSC General Maths syllabus covers a wide array of topics. Below are the key areas along with essential formulas students should be familiar with:

## 1. Algebra

Algebra involves the manipulation of symbols and the solving of equations. Key formulas include:

- Quadratic Formula:
$$
x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}
$$
- Factoring Techniques:
- Difference of Squares: $a^2 - b^2 = (a - b)(a + b)$
- Perfect Square Trinomial: $a^2 \pm 2ab + b^2 = (a \pm b)^2$

- Linear Equations:
$$
y = mx + c
$$
where $m$ is the slope and $c$ is the y-intercept.

# 2. Financial Mathematics

Financial mathematics focuses on concepts such as interest, annuities, and investments. Important formulas include:

- Simple Interest:
$$
I = P \times r \times t
$$
where $I$ is the interest, $P$ is the principal, $r$ is the rate, and $t$ is the time in years.

- Compound Interest:
$$
A = P(1 + r/n)^{nt}
$$
where $A$ is the amount after time $t$, $n$ is the number of times interest is compounded per year.

- Present Value of an Annuity:
$$
PV = Pmt \times \frac{1 - (1 + r)^{-n}}{r}
$$

# 3. Geometry and Measurement

Geometry and measurement involve the study of shapes, sizes, and properties of space. Key formulas include:

- Area and Perimeter:
- Rectangle:
- Area: $A = l \times w$
- Perimeter: $P = 2(l + w)$
- Triangle:
- Area: $A = \frac{1}{2} \times b \times h$
- Perimeter: $P = a + b + c$

- Volume and Surface Area:
- Cylinder:
- Volume: $V = \pi r^2 h$
- Surface Area: $SA = 2\pi r(h + r)$
- Sphere:
- Volume: $V = \frac{4}{3}\pi r^3$
- Surface Area: $SA = 4\pi r^2$

# 4. Statistics and Probability

Statistics and probability involve the collection, analysis, interpretation, and presentation of data. Important concepts include:

- Mean (Average):
$$
\text{Mean} = \frac{\sum x}{n}
$$
- Median: The middle value when data is arranged in ascending order.
- Mode: The value that appears most frequently in a data set.

- Probability:
- Probability of an event $A$:
$$
P(A) = \frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}
$$

# 5. Trigonometry

Trigonometry deals with the relationships between angles and sides of triangles. Essential formulas include:

- Basic Trigonometric Ratios:
$$
\sin(\theta) = \frac{\text{Opposite}}{\text{Hypotenuse}}, \quad \cos(\theta) = \frac{\text{Adjacent}}{\text{Hypotenuse}}, \quad \tan(\theta) = \frac{\text{Opposite}}{\text{Adjacent}}
$$

- Pythagorean Theorem:
$$
a^2 + b^2 = c^2
$$

- Trigonometric Identities:
- Sine and Cosine:
$$
\sin^2(\theta) + \cos^2(\theta) = 1
$$

# Tips for Using the HSC General Maths Formula Sheet

1. Familiarize Yourself: Spend time reviewing the formula sheet regularly to familiarize yourself with the formulas and their applications.

2. Practice Problems: Apply the formulas in practice problems to reinforce your understanding of how and when to use them.

3. Create Your Own Sheet: While the official formula sheet is essential, creating a personalized version with additional notes or examples can enhance your learning experience.

4. Highlight Key Formulas: Use highlighters to mark formulas you find challenging or that you frequently forget.

5. Group Study: Discuss and quiz each other on formulas in a study group to solidify your knowledge.

# Conclusion

The HSC General Maths formula sheet is a vital resource for students aiming to excel in their mathematics examinations. By understanding and applying the formulas from various topics such as algebra, financial mathematics, geometry, statistics, probability, and trigonometry, students can enhance their problem-solving skills and boost their confidence. With diligent preparation and effective use of the formula sheet, students can navigate the complexities of the HSC General Maths syllabus and achieve their academic goals.

# Frequently Asked Questions

## What is included in the HSC General Maths formula sheet?

The HSC General Maths formula sheet includes key formulas related to algebra, geometry, statistics, and finance, providing students with essential tools to solve mathematical problems effectively.

## How can I best utilize the HSC General Maths formula sheet during exams?

To best utilize the formula sheet during exams, familiarize yourself with its layout and content beforehand, practice applying the formulas in various problems, and refer to it strategically for quick access during the exam.

## Are calculators allowed when using the HSC General Maths formula sheet?

Yes, calculators are typically allowed when using the HSC General Maths formula sheet, but it's important to check the specific regulations for your exam as they can vary.

## Can I bring my own formula sheet to the HSC General Maths exam?

No, students must use the official HSC General Maths formula sheet provided during the exam; personal formula sheets are not permitted.

# How often should I review the formulas on the HSC General Maths formula sheet?

It's advisable to review the formulas regularly throughout your study period, especially before exams, to ensure you are familiar with them and can recall them easily under exam conditions.

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