

# Tips

## Things to remember

### 1. Standard trigonometric values.

Learn the table

degrees	30°	45°	60°
radians	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$
sin	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$
cos	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$
tan	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$

### 2. Recurrence relations:

Write down the relation first in the form:  $u_{n+1} = mu_n + c$   $u_0 = \dots$

Remember if something is reduced by 20%, you are left with 80% i.e.  $m = 0.8$

Condition for limit.  $|m| < 1$  or  $-1 < m < 1$

Learn the limit formula:  $L = \frac{c}{1-m}$

### 3. Perpendicular gradients

To show two lines are perpendicular, write down and show that  $m_1 \times m_2 = -1$

To find a perpendicular gradient us:  $m_2 = -\frac{1}{m_1}$

### 4. Vectors and collinearity (3 steps)

Show that vectors are **scalar multiples**

This means that the lines are **parallel**

If there is a **common point** then the points are **collinear**.

### 5. Vectors and Ratios

Do not write vectors as division.

You should **NOT** write:  $\frac{\overline{AB}}{\overline{BC}}$ . Vector division is undefined.

## Tips continued .....

### Things to remember

#### 6. Sketches

Use sketches to help you see what is going on.

#### 7. The straight line.

**Median:** Line from a vertex to **MID-POINT** of opposite side.

**Altitude:** Line from a vertex **PERPENDICULAR** to opposite side.

**Perpendicular bisector:** Line passing through the **MID-POINT** of a line and **PERPENDICULAR** (at  $90^\circ$ ) to it.  
The line does not usually go through a vertex.

#### 8. Differentiation

Before differentiating put into straight line form.

Before evaluating - put back into root form or positive index form.

Look out for examples of the chain rule.

$$\frac{d}{dx}\{(f(x))^n\} = n(f(x))^{n-1} \cdot f'(x)$$

The simple case is:  $\frac{d}{dx}(\dots\dots\dots)^n = n(\dots\dots\dots)^{n-1} \cdot \frac{d(\dots\dots\dots)}{dx}$

#### 9. Integrals

If there are no limits on the integral sign, then it is an **INDEFINITE** integral.

You **MUST** include a **constant of integration**  $C$ .

Look out for the standard integral:  $\int (ax+b)^n dx \rightarrow \frac{(ax+b)^{n+1}}{(n+1) \cdot a} + C$

When writing out an integral – do NOT forget to write  $dx$

Area between two curves:  $\int_a^b g(x) - f(x) dx$

where  $g(x)$  is the upper curve and  $f(x)$  is the lower curve  
and  $a$  and  $b$  are the  $x$ -coordinates of the intersection of the two curves.

**There are many more tips, I am sure you can add to these yourself.**