



# CHAPTER 2: LINEAR INEQUALITIES

---



# CHAPTER ANALYSIS

---

- Solving linear inequalities in one variable and representing the solution on the number line.
- Simultaneous Linear Inequalities



# RECAP OF LINEAR INEQUALITIES FROM SECONDARY 2


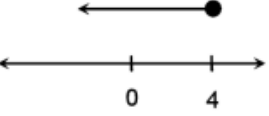

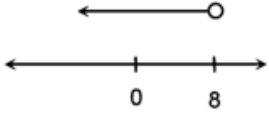
Things to take note of:

- The values on your number line increases from left to right (smaller number on the left, bigger number on the right)
- Try to have equal intervals on your number line (try not to skip numbers such as going from 1 to 4 without labelling 2 and 3 in between)

## Linear Inequalities Symbols

Symbol	Name
$>$	Greater than
$<$	Less than
$\geq$	Greater than or equal to
$\leq$	Less than or equal to

## Linear Inequalities on a Number Line

Symbol	Definition	Diagram Representation
	Number under the dot is included in the solution	
	Number under the circle is <b>NOT</b> included in the solution	



# SOLVING OF SIMULTANEOUS LINEAR INEQUALITIES

Things to take note of:

- Separate the equation into two different lines of inequalities when you are unable to isolate the unknown in the middle

Example:

$$2 < 2x < 20$$

- When you end up with two inequalities like the example question, draw a number to represent your solutions to find the optimal solution.

Solve the inequality

$$-\frac{17-8x}{4} < 2 - \frac{4-3x}{2} < 5\frac{1}{3}$$

Hence, state the smallest prime number that satisfies the inequality

[S4 AHS P1/2018 PRELIM Qn 4]

Solution

$$-\frac{17-8x}{4} < 2 - \frac{4-3x}{2} < 5\frac{1}{3}$$

$$-\frac{17-8x}{4} < 2 - \frac{4-3x}{2}$$

$$-\frac{17-8x}{4} < \frac{8-2(4-3x)}{4}$$

$$-\frac{17-8x}{4} < \frac{8-8+6x}{4}$$

$$-(17-8x) < 6x$$

$$2x < 17$$

$$x < 8\frac{1}{2}$$

$$2 - \frac{4-3x}{2} < 5\frac{1}{3}$$

$$\frac{4-(4-3x)}{2} < \frac{16}{3}$$

$$9x < 32$$

$$x < 3\frac{5}{9}$$

$$\therefore x < 3\frac{5}{9}$$

The smallest prime number is 2



# MORE EXAMPLES

## Worked Example A7.5.2

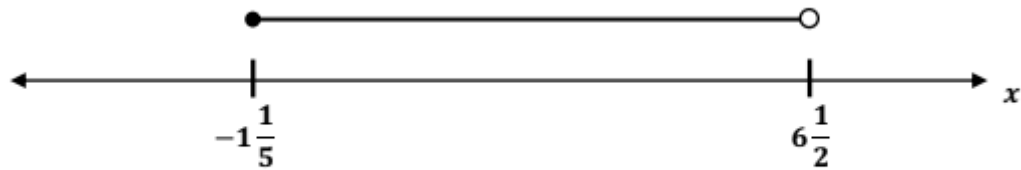
Solve the linear inequality and represent their solution on the number line provided

$$\frac{4}{3}x - 14 \leq 3(x - 4) < 7.5$$



Hence, write down the smallest integer which satisfies the inequality above

[S4 SMSS P2/2019 MYE Qn 20]



The smallest integer which satisfy the inequality is  $-1$

-Represent your solutions from the two inequalities that you have found on a number to obtain the optimal solution

## Solution

$$\frac{4}{3}x - 14 \leq 3(x - 4) < 7.5$$

$$\frac{4}{3}x - 14 \leq 3(x - 4)$$

$$4x - 42 \leq 9x - 36$$

$$5x \geq -6$$

$$x \geq -1\frac{1}{5}$$

$$3(x - 4) < 7.5$$

$$x - 4 < 2.5$$

$$x < 6\frac{1}{2}$$

$$-1\frac{1}{5} \leq x < 6\frac{1}{2}$$



# MEET THE OVERMUGGED TEAM

## MEET OUR ALL-STAR TUTORS

All our tutors have between **7-13 years of teaching experience** and have guided countless batches of students to excel at 'O' Levels & 'A' Levels.

UNLOCK YOUR FULL POTENTIAL.





07

### LOCATIONS

We have classes across 7 locations in Singapore, with **3 main branches**.

20+

### TUTORS

We have a team of 20+ tutors, each specialising in their respective subjects.

70%

### RESULTS

About **70%** of OVERMUGGED students score an A1/A2 at 'O' Levels/'A' Levels.

700+

### STUDENT UNDER OUR CARE

We have about 700+ students under our care which we work closely with on a week-on-week basis!

## SOME STATS

### SG FASTEST GROWING TUTORIAL BRAND

We believe in uplifting the student community!



OVERMUGGED, 'O' Levels Channel  
6,214 subscribers



OVERMUGGED, 'A' Levels Channel  
2,778 subscribers

*One of SG largest Telegram student community*



# LEADERS IN THE CHANGING EDUCATION LANDSCAPE

## FEATURED ON STRAITS TIMES


Our efforts to go out of our way to support our students were captured by local new publications.

OVERMUGGED was SG first tuition center to host large scale mock exam!

Our student's needs comes first!


**Vulcan Post** 12h

Overmugged launched a tuition subscription plan for 'O' Levels subjects to make education more affordable and accessible, and has achieved a six-figure revenue in its first year.



**TODAY** June 16 at 5:49 PM

One Primary 6 student who is sitting mock exams told TODAY: "I feel stress didn't do any exams all the way until prelims and PSLE... I'll be unfamiliar with environment and I cannot concentrate."



**OVERMUGGED:** This 28-year-old built Singapore's first online tuition subscription service

You and 8 others Like Comment Share

**With midterms scrapped, students take mock exams at tuition centres**

Students taking a mock exam paper at tuition centre Overmugged. Tuition centres said they organised such sessions following strong demand after mid-year exams were scrapped for all primary and secondary schools from 2023. Education Minister Chan Chun Sing said in March 2022 that the move would give students space to develop their interests and focus on their learning and well-being.

**Many in Primary 6 and Secondary 4 seek to build experience ahead of national exams**

Wong Shihing

Handfuls of students are seen in a room at a tuition centre to take mock mid-year examinations. The primary and secondary schools have scrapped the mid-year exams in 2023.

Many of these students are in Primary 6 and Secondary 4, as they are the last year before national examinations. They are taking mock exams to build experience ahead of national exams.

Primary school Learning Executive Chan Jia Ying, a 20-year-old student, said she was nervous about the exam. She said she had never taken a mock exam before. She said she was nervous about the exam. She said she had never taken a mock exam before.

**P6 and Sec 4 students flock to tuition centres for mock exams after scrapping of school midterms**

Wong Shihing The Straits Times

**ASSOCIATE PROFESSOR JASON TAN** said the National Institute of Education (NIE) has been working on ways to help students to be familiar with the exam-taking experience.

**ASSOCIATE PROFESSOR JASON TAN** said the National Institute of Education (NIE) has been working on ways to help students to be familiar with the exam-taking experience.





# OUR LOCATIONS



**BUKIT TIMAH**  
**Tan Kah Kee**  
2 min walk from Tan Kah Kee MRT.



**Kovan**  
**Upper Serangoon Road**  
5min walk from Kovan MRT.



**MARINE PARADE**  
**PARKWAY CENTER**  
Upcoming TE line in 2024.



**TOA PAYOH**  
**CLASSROOM**  
Conveniently located near Toa Payoh MRT



**JURONG EAST**  
**CLASSROOM**  
Right beside Jurong East MRT



**WOODLANDS**  
**CLASSROOM**  
Right beside Woodlands MRT



**TAMPINES**  
**READY IN 2024**  
Right beside Tampines MRT



# OUR SECRET TO PRODUCE TOP RESULTS?



**CONSISTENT HARD WORK,  
OVER A LONG PERIOD OF TIME.**

We work hard consistently alongside you, week in, week out.

**We grind hard when no one is watching** because we know that when it comes time for exams, we will be one cut above the rest.



# LEARNING RESOURCES

IF YOU THOUGHT THE FREE MATERIALS ARE GOOD,  
Wait till you see the resources our own students get!



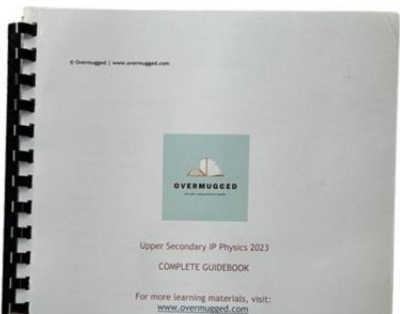
## WEEKLY WORKSHEETS

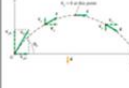
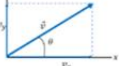
Topical, Thematic, Mock Test, Mock Exam,  
Prelim Prep, Practical Prep



## EXCLUSIVE CHEATSHEETS

Revision booklets, extra cheatsheets,  
Practical Assessment booklet



TOPIC: KINEMATICS			
Concept	Definition	Formula	Remarks
Linear motion	<ul style="list-style-type: none"> <li>Object that is moving in a straight line</li> <li>1-D motion</li> </ul>	$v = u + at$ $s = ut + \frac{1}{2}at^2$ $v^2 = u^2 + 2as$	<ul style="list-style-type: none"> <li>Motion can be represented (upwards or right) or -ve (down or left) sign.</li> <li>Equations can only be used if acceleration is constant.</li> </ul>
2-D Motion	<ul style="list-style-type: none"> <li>Object that is moving in a projectile trajectory (x and y directions)</li> <li>2-D motion</li> <li>Acceleration is experienced in both axes</li> <li>Vertical and horizontal motion are independent of each other</li> </ul>	<p>Horizontal motion (acceleration = 0)</p> $v_x = u_x$ $s_x = u_x t$ <p>Vertical motion (uniform vertical acceleration = g)</p> $v_y = u_y + at$ $s_y = u_y t + \frac{1}{2}at^2$ $v_y^2 = u_y^2 + 2as$	<ul style="list-style-type: none"> <li>Acceleration always act down</li> <li>Projectile will free fall and parabolic if resistance is negligible</li> </ul> 
2 Vectors resolution	Analyse the horizontal and vertical motion separately	 <p>For a vector <math>\vec{v}</math> pointing at an angle <math>\theta</math> from the horizontal:</p> $v_x = v \cos\theta$ (horizontal) $v_y = v \sin\theta$ (vertical) $v = \sqrt{v_x^2 + v_y^2}$ $\tan\theta = \frac{v_y}{v_x} \Rightarrow \theta = \tan^{-1}\left(\frac{v_y}{v_x}\right)$	

**MARCH PRACTICE QUESTIONS 2021**  
SECONDARY 4 EXPRESS  
SECONDARY 5 NORMAL ACADEMIC

ELEMENTARY MATHEMATICS 4048/01

Specimen Paper  
Date: 3 March 2021  
Candidates answer on separate writing paper

Mean THESE INSTRUCTIONS FIRST

Answer all questions.  
If working is needed for any question it must be shown with the answer.  
Division of marks for correct working will result in total marks.  
You are expected to use a scientific calculator to evaluate explicit numerical expressions.  
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures.  
Give answers in degrees to one decimal place.  
For  $\pi$ , use either your calculator value of 3.142, unless the question requires the answer in terms of  $\pi$ .

Topic names will be listed above each question for your benefit and revision

Upon completion of solutions:  
Each candidate have exactly 2 weeks to submit their solution.  
Take a picture or send the digital version of your solutions to me (Kahen) via Telegram (@Kahen\_tutari) or WhatsApp (90583779).  
Ensure that all workings are clear and legible.  
Solutions will be marked based on your presentation, accuracy and completeness of your solution.  
A markers' report and the full solutions will be provided at the end of the month.

Setter: Ong Kai Wen  
This question paper consists of 2 printed pages including the cover page

not reached in a time $t$ if $v_y = 0$	$v_y^2 = (u \sin\theta)^2 - 2gh$ $\Delta H = \frac{u^2 \sin^2\theta}{2g}$	<ul style="list-style-type: none"> <li>With air resistance,</li> <li>Drag force acts in the same as the weight of object.</li> <li>Net acceleration <math>&gt;&gt; g</math></li> <li>Maximum height reached lower.</li> </ul>
if $v_y = 0$	$v_y = u \sin\theta - gt_{up}$ $\Delta t_{up} = \frac{u \sin\theta}{g}$	<ul style="list-style-type: none"> <li>With air resistance,</li> <li>Drag force acts in the same as the weight of object.</li> <li>Net acceleration <math>&gt;&gt; g</math></li> <li>Final vertical speed smaller than vertical speed</li> <li>Average speed upwards <math>&gt;&gt; g</math></li> </ul>

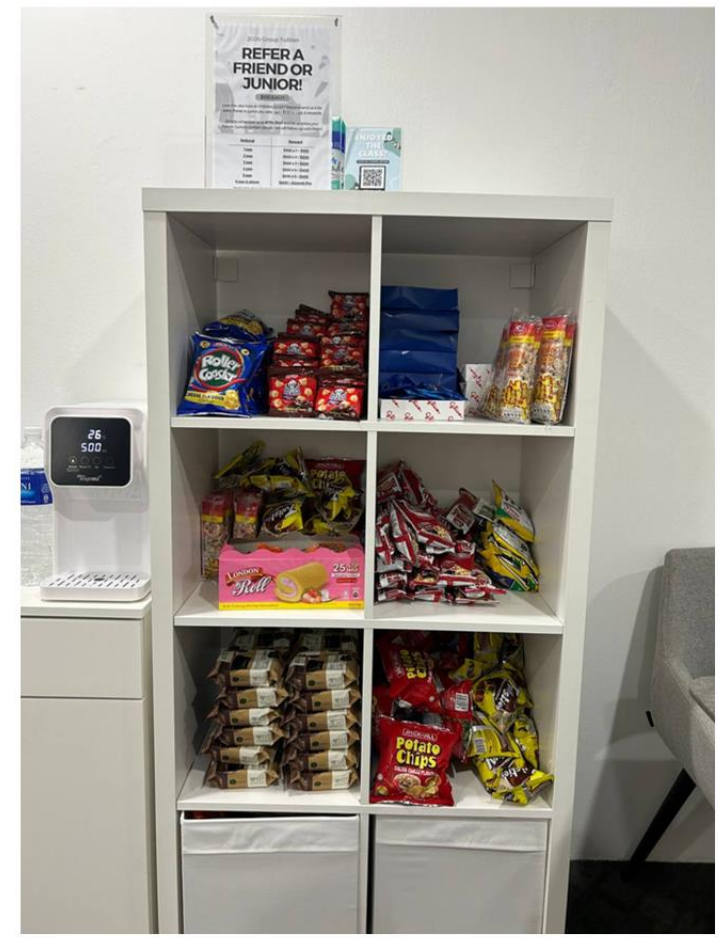




# WELFARE, ALL DAY EVERYDAY



**NEED FOOD TO THINK**  
Unlimited snack shelf





### Our Policy

- No deposit fee.
- No extra material fee.
- Unlimited access to study lounge.
- Unlimited snacks.
- Free consultations.
- Special discounts for holiday program.

# TUITION RATES

## 'O' LEVELS

- \$80/lesson
- \$85/lesson (weekend)

## INTEGRATED PROGRAM

- \$90/lesson
- \$95/lesson (weekend)

## 'A' LEVELS

- \$100/lesson
- \$105/lesson (weekend)
- 10% if signing up for 2 'A' Levels subject & above*

*Fees are collected at the start of the term (every 3 months).*



# ACADEMIC YEAR

## TERM 1: NOV – JAN

### Topical Recaps

Key highlight: Christmas Party

## TERM 2: FEB – APR

### Topical Mastery

Key highlight: March Holiday Cohesion Program

## TERM 3: MAY – JUL

### Prelim/EOY Preparation

Key highlight: Mock Prelim/EOY

## TERM 4: AUG – OCT

### 'O' Levels / 'A' Levels Preparation

Key highlight: Mock Exams, Science Practical Assessment





# Sign up for a free trial lesson today!

Class Schedule:

SCAN ME



Whatsapp us:



SCAN ME

**Any enquiries?**  
**Whatsapp: 8770 2540**  
**Email: overmugged@gmail.com**  
**Website: www.overmugged.com**  
**IG/Tiktok: @overmugged**