

Preparing for Examinations

FRED LONGWORTH
HIGH SCHOOL



Welcome

THANKS FOR COMING



Aims of the evening:

- To provide you and your child with specific revision strategies for core subjects to be used in the upcoming mock examinations, and in the final approach to the GCSEs;
- To offer practical advice to parents for helping your child to complete effective revision;
- To provide an opportunity to answer your questions and discuss any concerns you may have.



Maths Higher Tier Revision

Exam dates...

Paper 1 : Friday 19th May 2023

Paper 2 : Tuesday 6th June 2023

Paper 3 : Wednesday 14th June 2023



Let's pick a topic: EQUATION OF A
LINE

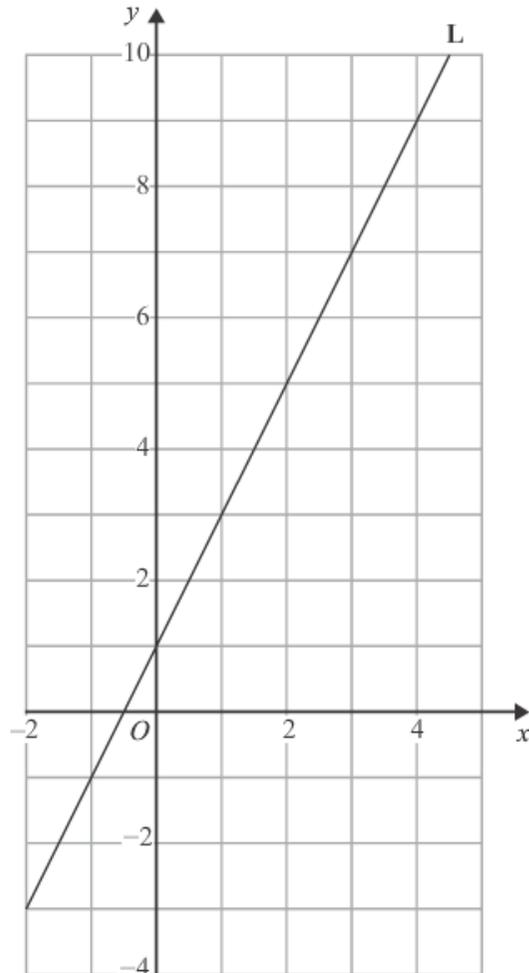
But how
do I
revise
it???





What do you know already?

Line **L** is drawn on the grid below.



Find an equation for the straight line **L**.
Give your answer in the form $y = mx + c$

What can you do to help?

- Remember there are so many maths resources already done and videos to watch (we will go through these).
- Encourage your child to use the topic list and focus on topics they find **DIFFICULT**.
- Use resources with answers so you can **check** together.

Equation of a line Revision...

Mathsgenie :

Gradient of a line

Parallel and Perpendicular Lines

Equation of a tangent to a circle

GCSE Revision

[Click here to view the 2016 A*-E Specification](#)

NEW: Revision Topics/Lists for May/June 2022 Exams:

• [Edexcel Foundation](#) • [Edexcel Higher](#) • [AQA Foundation](#) • [AQA Higher](#) • [OCR Foundation](#) • [OCR Higher](#)

Grade 5

| Videos | Exam Questions | Exam Questions Booklet | Solutions |
|------------------------------------|--------------------------------|------------------------------------|---------------------------|
| Gradient of a Line | Exam Questions | Gradient of a Line | Solutions |

Grade 6

| Videos | Exam Questions | Exam Questions Booklet | Solutions |
|--|--------------------------------|--|---------------------------|
| Parallel and Perpendicular Lines | Exam Questions | Parallel and Perpendicular Lines | Solutions |

Grade 8/9

| Videos | Exam Questions | Exam Questions Booklet | Solutions |
|---|--------------------------------|-------------------------------------|---------------------------|
| Perpendicular Lines and the equation of a tangent | Exam Questions | Perpendicular Lines | Solutions |

A mixture of GCSE style questions.

All answers to the questions with working out to check!

Equation of a Line Revision...

Corbett Maths :

Practice questions are exam style and textbook exercises are several different questions with problem solving in most cases.

Each video shows examples and questions

Linear graphs: gradient of a line [Video 189](#) [Practice Questions](#) [Textbook Exercise](#)

Linear graphs: gradient between points [Video 190](#) [Practice Questions](#) [Textbook Exercise](#)

Linear graphs: $y=mx+c$ [Video 191](#) [Practice Questions](#) [Textbook Exercise](#)

Linear graphs: $y=a$ graphs [Video 192](#) [Practice Questions](#) [Textbook Exercise](#)

Linear graphs: $x=a$ graphs [Video 193](#) [Practice Questions](#) [Textbook Exercise](#)

Linear graphs: find equation of a line [Video 194](#) [Practice Questions](#) [Textbook Exercise](#)

Linear graphs: equation through 2 points [Video 195](#) [Practice Questions](#) [Textbook Exercise](#)

Linear graphs: parallel lines [Video 196](#) [Practice Questions](#) [Textbook Exercise](#)

Linear graphs: perpendicular lines [Video 197](#) [Practice Questions](#) [Textbook Exercise](#)

Linear graphs: midpoint of a line [Video 198](#) [Practice Questions](#) [Textbook Exercise](#)

Linear graphs: real life [Video 198a](#)

Equation of a Line Revision...

Mathswatch...

Interactive questions to try

Find a Clip

Qualification: GCSE

Tier: All

Grade: All

Topic: Algebra

Search: |

Choose Clip (66)

| Clip | Title |
|------|--|
| 157 | Factorising and Solving Quadratics |
| 158 | The Difference of Two Squares |
| 159a | Equation of a Straight Line - $y = mx+c$ |
| 159b | Equation of a Straight Line - Gradient and Coord |

Standard Questions 1 2 3 4 5 Harder Questions 1 2 3 4 5

Question Progress

Work out the equation of the line which has a gradient of 2 and passes through the point (2, 5).

Submit Answer

Video for each

Clip 159b Equation of a Straight Line - Gradient and Coordin One Minute Maths Interactive Questions Worksheet

Clip 159

FINDING THE EQUATION OF A STRAIGHT LINE

GRADIENT and COORDINATES

00:01

ALGEBRA

Had a look Nearly there Nailed it!



Straight-line graphs 2

On page 25 you can revise how to find an equation by looking at a graph. You can also use algebra to find the equation. This is usually a more reliable and accurate method.

1 Given one point and the gradient

Substitute the gradient for m in $y = mx + c$

Gradient 2, passing through point (3, 7)

Substitute the x - and y -values given into the equation

$$y = 2x + c$$

$$7 = 2 \times 3 + c$$

$$7 = 6 + c \quad (-6)$$

$$c = 1$$

$$y = 2x + 1$$

Solve the equation to find c

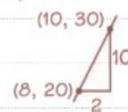
Write out the equation

2 Given two points

Draw a sketch showing the two points

Passing through points (8, 20) and (10, 30)

Work out the gradient of the line using a triangle



Use method 1 (on the left) and one of the points given to find the equation

$$\text{Gradient} = \frac{10}{2} = 5$$

$$y = 5x + c$$

$$30 = 5 \times 10 + c$$

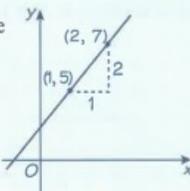
$$c = -20$$

$$y = 5x - 20$$

Worked example

Target grade 5

A line passes through the points with coordinates (1, 5) and (2, 7). Find the equation of the line. (3 marks)



Gradient, $m = \frac{2}{1} = 2$

Equation of line: $y = mx + c \rightarrow y = 2x + c$

For point (1, 5), $x = 1, y = 5$

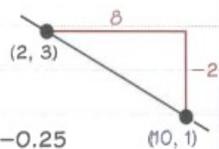
Substitute these values into the equation:

$$5 = 2 + c \rightarrow c = 3$$

The equation is $y = 2x + 3$

Positive or negative?

If the line slopes down then the gradient is negative.



$$\text{Gradient} = \frac{-2}{8} = -0.25$$

Examiners' report

Make sure you know how to find the equation of a line through two points:

1. Draw a sketch of the line.
2. Use a triangle to find the gradient.
3. Substitute the gradient and the x - and y -values of one of the points into $y = mx + c$.
4. Solve your equation to find c .

Real students have struggled with questions like this in recent exams - be prepared!



Target grade 5

Now try this

Worked solution video



Straight-line graphs 2

Hot Topic

Target grade 5

Guided

- 1 Find the equation of the straight line with
 - (a) gradient 3, passing through the point (2, 5)

$$y = 3x + c$$

$$5 = \dots \times \dots + c$$

$$c = \dots$$

$$y = \dots x \dots \dots \dots \quad (2 \text{ marks})$$
 - (b) gradient -2, passing through the point (3, 6)

$$\dots \dots \dots \quad (2 \text{ marks})$$
 - (c) gradient 4, passing through the point (-2, 7).

$$\dots \dots \dots \quad (2 \text{ marks})$$

Substitute the value of the gradient into $y = mx + c$. Then substitute the x - and y -values given into your equation. Solve the equation to find c . Remember to write your completed equation at the end.

Target grade 5

Guided

- 2 Find the equation of the straight line which passes through the points
 - (a) (3, 2) and (5, 6)

$$m = \frac{\dots - \dots}{\dots - \dots} = \dots$$

$$2 = \dots \times 3 + c$$

$$c = \dots$$

$$y = \dots \dots \dots \quad (3 \text{ marks})$$
 - (b) (2, 5) and (4, 9)

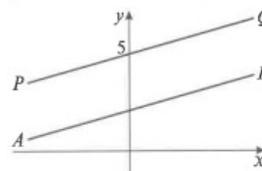
$$\dots \dots \dots \quad (3 \text{ marks})$$
 - (c) (-1, -2) and (-4, -8).

$$\dots \dots \dots \quad (3 \text{ marks})$$

Examiners' report Work out the gradient and then substitute x - and y -values for one of the points into the equation $y = mx + c$ to work out c .

Target grade 5

- 3 Here are two straight lines. AB is parallel to PQ . The equation of the line AB is $y = 4x + 1$. Find the equation of the straight line PQ .



Find the gradient of AB . Find the value of the y -intercept for PQ . Use $y = mx + c$ to find the equation of PQ .

..... (2 marks)

Target grade 5

- 4 A straight line passes through the points with coordinates (-1, -1), (3, 15) and (k, 23). Work out the value of k . You must show all your working.

Problem solved! First work out the gradient of the line using the first two points.

$k = \dots \dots \dots$ (4 marks)

Revision cards...

- Remember that **DOING** maths is better than **READING** maths.
- Encourage your child to actually sit and answer questions and **check** them.
- Make some **revision cards**, with a skill/formula on one side, and an example question on the other.
- Tick off once a skill is mastered and highlight what you still need to revise!

* Example *

Find the equation of the line which passes through A $(-1, -4)$ and B $(3, 4)$.

x_1 y_1

x_2 y_2

$m = \text{gradient}$

① Find the gradient (m):

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - (-4)}{3 - (-1)} = \frac{4 + 4}{3 + 1} = \frac{8}{4} = 2$$

② Sub into $y = mx + c$ to find c.

Answer: $y = 2x - 2$

Using $(3, 4)$

$$\begin{aligned} y &= mx + c \\ 4 &= (2 \times 3) + c \\ 4 &= 6 + c \\ -6 & \quad -6 \\ \hline -2 &= c \end{aligned}$$

Front:
The key information and example question

* Practice Question *

Find the equation of the line which passes through A $(-2, 7)$ and B $(1, -2)$.

x_1 y_1

x_2 y_2

① Gradient (m) = $\frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - 7}{1 - (-2)} = \frac{-9}{3} = -3(m)$

② Sub into $y = mx + c$ using $(-2, 7)$ or $(1, -2)$.

$(-2, 7) \rightarrow y = mx + c$

$$\begin{aligned} 7 &= (-3 \times -2) + c \\ 7 &= 6 + c \\ -6 & \quad -6 \\ \hline 1 &= c \end{aligned}$$

Answer $\rightarrow y = -3x - 6$

Back:
Practice question and solution



Revision sessions...

Wednesday after school, 3 – 3.45pm.
Most started yesterday.

To summarise...

- **Mathswatch** – the videos are great for learning the skills and the interactive questions provide you with instant feedback.
- **Corbett Maths** – another way to watch videos and practice what you have learnt. All questions have answers attached.
- **Mathsgenie** – great for exam style questions. All exam questions have worked solutions.