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Description automatically generated

R Girls School

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title: "Equations of Straight Line Graphs - Part 2"

author: "Type your name here"

date: "`r format(Sys.time(), '%d %B, %Y')`"

output: html\_document

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```{r setup, include=FALSE}

knitr::opts\_chunk$set(echo = TRUE)

library(tidyverse)

```

### KS3: Plotting and finding the equations of straight line graphs (y=mx+c) - Part 2

### Lesson objectives

Plotting and finding the equations of straight line graphs y=mx+c

### Success criteria

\* Plot a straight line graph y = mx+c

\* Plot straight line graphs y = mx+c with different intercepts

\* Plot a straight line graph y = mx+c with a negative gradient

\* Find the equations of straight line graphs

### Keywords

\* slope

\* gradient

\* intercept

\* x-axis

\* y-axis

#### Worked Example 1

This is a worked example for you to follow.

We will show you how to plot the line graph for y=2x + 5.

```{r chunk1}

x <- seq(from=-4, to=4, by=1) # sequence the x-axis from -4 to 4

y <- 2\*x+5

mydata <- tibble (x,y)

ggplot(mydata) +

aes(x,y) +

geom\_point () +

geom\_line (col='red')+

geom\_vline (xintercept = 0, col='black')+

geom\_hline (yintercept = 0, col='black')

```

#### Worked Example 2

We will now see what happens when you change the intercept c to a negative value.

1. y=3x+5

2. y=3x-5

Run the code in chunk2 by clicking on the little arrow on the right of the code chunk.

```{r chunk2}

x <- seq(-4, 4) # sequence from -4 to 4

y1 <- 3\*x+5

y2 <- 3\*x-5

mydata <- tibble (x,y1,y2,y)

ggplot(mydata) +

geom\_line (aes(x=x, y=y1), col='red')+

geom\_line (aes(x=x, y=y2), col='blue')+

geom\_vline (xintercept = 0, col='black')+

geom\_hline (yintercept = 0, col='black')

```

Question: What is the same and what is different about these lines?

Answer:

Knit your document and check the output.

#### Activity 1

Draw these lines on a graph. Use the R code from chunk2 to help you. Remember to update the code with these new lines.

1. y=x+10

2. y=x-10

```{r chunk3}

```

Question: What is the same and what is different about these lines?

Answer:

#### Activity 2

Now we will investigate m (the gradient). Draw these lines on a graph. Use R code from chunk2 to help you.

Run the code and knit the document.

1. y=-2x+5

2. y= 2x+5

```{r chunk4}

```

Question: What is the same and what is different about these lines?

Answer:

#### Activity 3 Answer the following questions

```{r chunk5 questions, echo=FALSE}

cat ("Q1 In the equation y=mx+c, what happens when you change c?")

cat ("Q2 What happens when you change m?")

```

Write your answers here\

Q1:

Q2:

#### Activity 4: Work out the equation from a line graph

Write down the equations of the following four lines on the graph below.

Knit the document to get a good view of the graph.

```{r chunk6, echo=FALSE}

x <- seq(-10, 10)

y <- x

ggplot() +

aes(x,y)+

geom\_blank()+

geom\_abline(slope=1, intercept=0, col='red')+

geom\_abline(slope=-1, intercept=2.5, col='cyan')+

geom\_abline(slope=2, intercept=10, col='blue')+

geom\_abline(slope=0, intercept=5, col='orange')+

geom\_vline (xintercept=0, col='black')+

geom\_hline (yintercept=0, col='black')

```

Write your answers here

Cyan line:

Red line:

Blue line:

Orange line:

KNIT YOUR DOCUMENT for the final time. This will be the version that your teacher will mark.

#### THE END