Week 7/8 Term 1 2020

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**MM1
Functions and graphs**
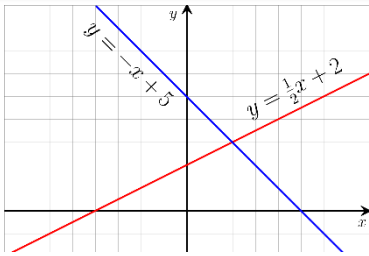Lines and linear relationships

Goals

By the end of this week, you should be able to

- examine examples of direct proportion and linearly related variables
- recognise features of the graph of $y = mx + c$, including its linear nature, its intercepts and its slope or gradient
- find the equation of a straight line given sufficient information; parallel and perpendicular lines
- solve linear equations

Theoretical Components

Knowledge checklist:
- Know about gradients (1C)
- Describe transformations of lines using language of dilation, change of gradient and vertical translation.
- Be able to sketch linear functions quickly, easily and with accuracy. (1D)
- Find the equation of a line given certain information. (1F and throughout the chapter)
- Use modelling techniques -applications using linear functions (1H)

Formulas

- General form for linear equations
$$y = mx + c$$
where m is the gradient and c is the y-intercept (when $x = 0$)

- Gradient
$$m = \frac{rise}{run} \quad \text{or} \quad m = \frac{y_2 - y_1}{x_2 - x_1}$$

- Perpendicular lines
$$m_1 \times m_2 = -1$$

- Parallel lines
$$m_1 = m_2$$

- Finding the equation of a straight line
$$y - y_1 = m(x - x_1)$$

Online reading
http://www.mathsisfun.com/algebra/linear-equations.html
http://www.mathsisfun.com/gradient.html
http://www.mathsisfun.com/data/straight_line_graph.html
http://www.mathsisfun.com/algebra/line-equation-point-slope.html

Videos
https://wootube.mathspace.co/topic?id=3195

Practical Components

You will require Chapter 1 of **Maths Quest 11 Mathematical Methods** (pdf - Google Classroom)
Do the following questions. Organise your solutions neatly in your exercise book:

1C Gradient of a straight line
Q's 1a, 2c, 7, 8

1D Sketching linear equations
Q's 8a,e, 9c,f, 10a, 14

1F Finding the equation of a straight line
Q's 5a,b, 12, 14, 15

1H Linear modelling
All even questions

Mathspace
Complete the www.mathspace.co task set for this week.

Investigation

Week 7
See following page

(20 marks – see rubric)

Week 8
Complete a summary sheet in preparation for the **test in Week 8.** (Two–sided hand-written A4 page) This will be collected at the end of the test. ☺

(0 marks)

QFO
Quiz/Forum/Other

- Complete the task (Linear Equations and Straight Lines) on www.mathspace.co

Remember to scan in when you come to Maths and when you leave.
You will need a calculator for the test. See Jenny or Chantal if you have any concerns.

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MM1 Investigation Week 7

Here are the equations of 12 straight lines.

$y = 4x + 4$	$4y = x + 3$	$y = 8x - 3$	$y + 4x + 6 = 0$
$3y = 2x - 8$	$y + 6x = 11$	$y + 8x = 6$	$2y + 8 = 3x$
$2y + x = 4$	$2y = 8x + 3$	$y = 6x - 4$	$y + x + 8 = 0$

These 12 straight lines can be divided up into six pairs, each pair matching one of the following descriptions:

Can you sort them into the correct pairs and complete the final description?

Hint: Rewrite each equation in the form $y = mx + c$

- These lines are parallel.

- These lines are perpendicular.

- These lines have the same y-intercept.

- These lines have the same x-intercept.

- These lines both go through the point (1,5).

- These lines …

(20 marks – see rubric)

This task is taken from https://undergroundmathematics.org/geometry-of-equations/lots-of-lines/download/lots-of-lines.pdf