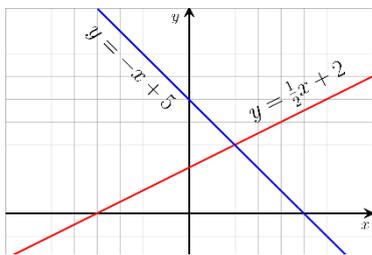


Goals



By the end of this fortnight, 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
- understand the concept of a function as a mapping between sets, and as a rule or a formula that defines one variable quantity in terms of another
- use function notation, domain and range, independent and dependent variables
- understand the concept of the graph of a function
- recognise the distinction between functions and relations, and the vertical line test.

Theoretical components

Knowledge checklist:

- Know about gradients (1C)
- 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)
- Define the domain and range of a function
- Use the vertical line test for functions
- Use your CAS

Formulas

- General form for linear equations

$$y = mx + c$$

where m is the gradient and c is the y -intercept (when $x = 0$)

- Gradient

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

- 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>
<https://www.mathsisfun.com/sets/function.html>
<https://www.mathsisfun.com/sets/domain-range-codomain.html>

Practical components

Chapters 1 & 4 of **Maths Quest 11 Mathematical Methods** (pdf - Google Classroom)

1C Gradient of a straight line

Qs 1(a), 2(c), 7, 8

1D Sketching linear equations

Qs 8(a,d), 9(c,f), 10(a), 14

1F Finding the equation of a straight line

Qs 5(a,b), 12, 14, 15

1H Linear modelling

All even questions

4C Domain and range

Qs 1(b,g), 2(d,h), 3, 7, 10

4D Types of relations

Qs 1(a,d,g,i), 2(a,d,g,j), 4

Mathspace

Complete the mathspace task set for this fortnight.

<https://mathspace.co/student/tasks/SubtopicCustomTask-1180179/>

Investigation

Week 6/7

See the next page

QFO

Quiz/Forum/Other

Complete the task set on Mathspace.

Test 1 will be held in week 9. It is worth 30% of your assessment.
More details to come.



MM1 Investigation Week 6/7

Here are the equations of 12 straight lines.

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

1. Rewrite each equation in the form $y = mx + c$

2. These 12 straight lines can be divided up into pairs/group, each pair matching one of the following descriptions. Sort them into the correct pairs and complete the final description.

- 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).