

“Straight Line Introduction (3 constructions)”

General

These three constructions can be used to introduce the topic of equations of straight lines to students who have not met it before.

The worksheet of 7 questions that follows this page takes the user in a structured manner through how the slope and intercept of a line connects to the equation of that line.

Student Specific

Either upload files HG011, HG012 and HG013, or construct them by following the construction videos. Then work your way through the worksheet. The last three questions are where you can really show what how deep your understanding of the topic has become.

Teacher Specific

The lesson that uses the attached worksheet requires the students to have HG011, HG012 and HG013 already installed on the graphic calculator they will be using.

This can be achieved by either the teacher uploading them for the students, or the students watching the construction movies and preparing them prior to the lesson itself.

Feedback

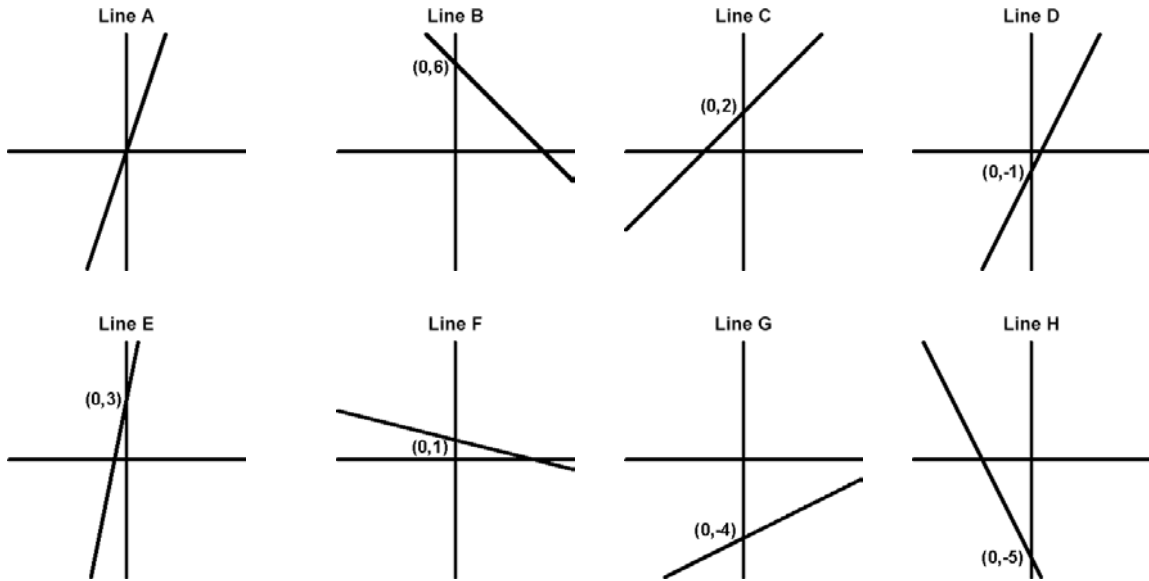
Do you have any comments on these notes?

Please get in Contact via the website and help improve them further.

All contributors are acknowledged.

Worksheet for CabriJr constructions HG011, HG012 and HG013

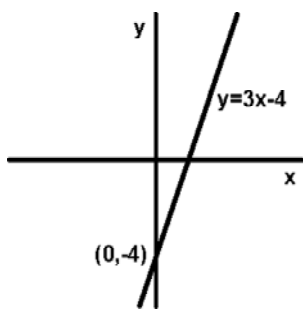
1. Look at the following sketches of 8 lines and the list of 8 equations.
Your task is to match each line to its corresponding equation.
You can use the CabriJr file HG011 to either help you complete this task, or to check your progress.



Equations:

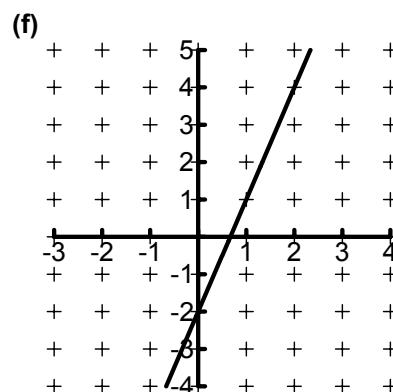
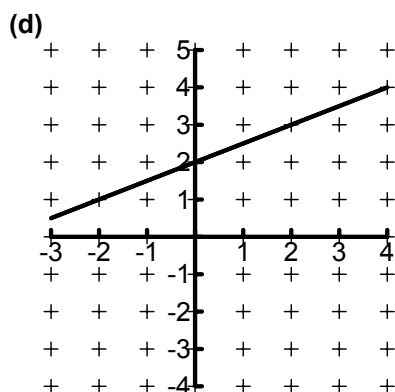
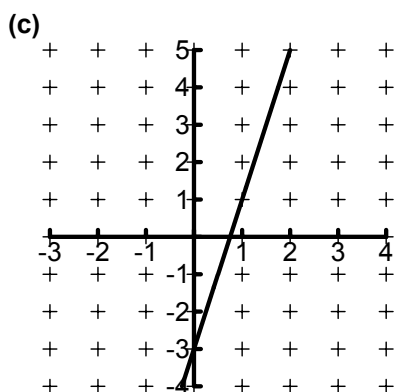
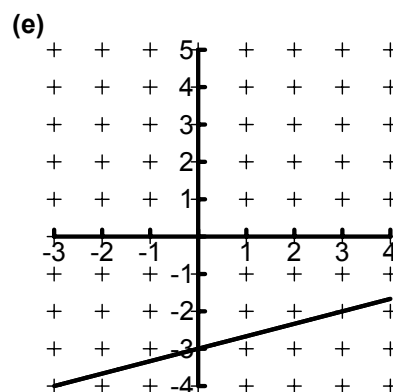
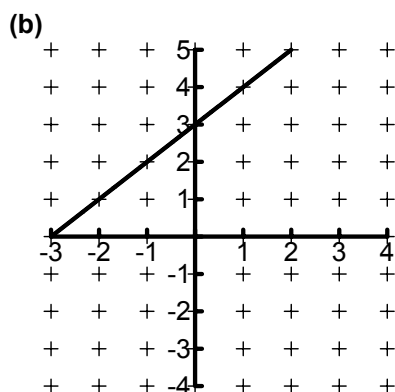
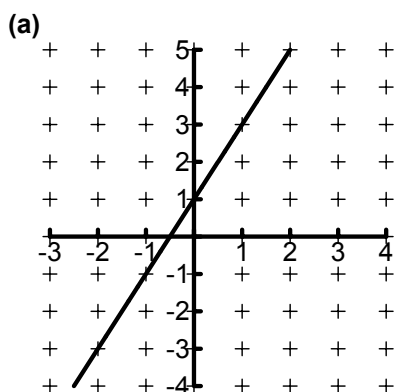
| | | | |
|---------------|--------------|-------------------------|-------------|
| $y = 2x - 1$ | $y = 5x + 3$ | $y = \frac{1}{2}x - 4$ | $y = 3x$ |
| $y = -2x - 5$ | $y = -x + 6$ | $y = -\frac{1}{4}x + 1$ | $y = x + 2$ |

2. This time, simply make a neat sketch of the graph of the given equation, indicating where it cuts the y-axis. Just like the one below.
Again, use the CabriJr file HG011 to either help you complete this task, or to check your progress.

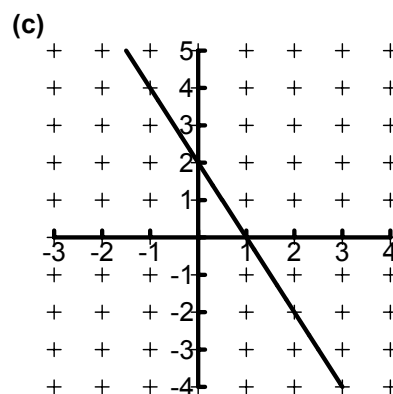
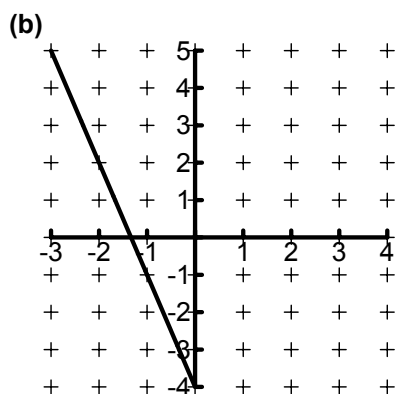
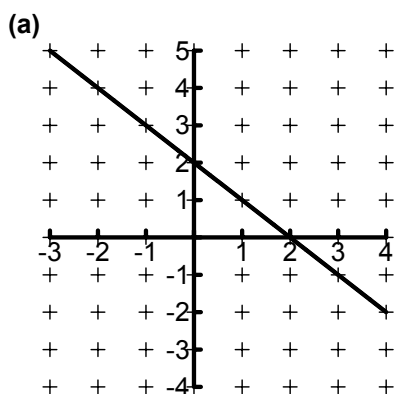


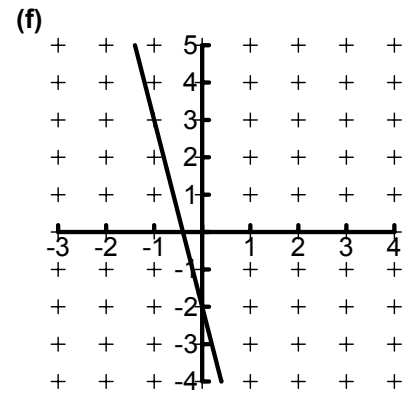
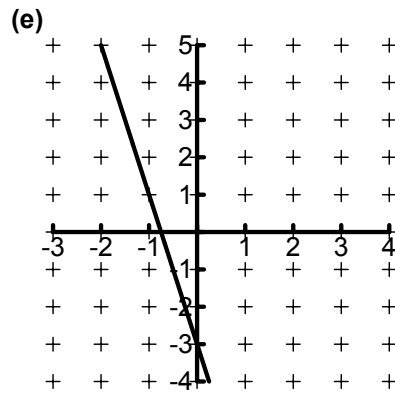
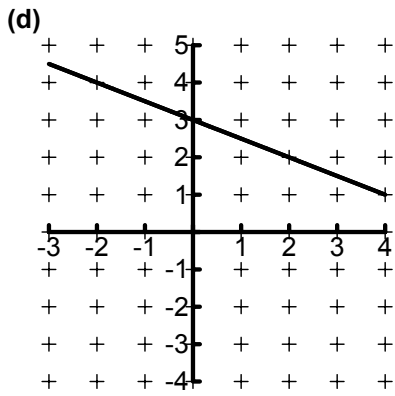
- | | |
|---------------------------|----------------------------|
| a) $y = x + 3$ | g) $y = \frac{1}{5}x + 2$ |
| b) $y = 2x - 3$ | h) $y = -\frac{1}{2}x + 4$ |
| c) $y = \frac{1}{2}x + 6$ | i) $y = -4x - 3$ |
| d) $y = -2x + 3$ | j) $y = \frac{4}{3}x - 1$ |
| e) $y = -x - 4$ | |
| f) $y = 6x - 6$ | |

3. For each of the following 6 graphs of functions, determine the equation for each one.
 Look carefully to see which points each line goes through.
 Check your progress using CabriJr file HG012



4. For each of the following 6 graphs of functions, determine the equation for each one.
 Look carefully to see which points each line goes through.
 Check your progress using CabriJr file HG013





5. Now open the CabriJr file HG013.
You can change the position of the line by moving either of the points that are on the line. Neither of these points is fixed to either axis, so they are free to be moved anywhere. Your task is to see how you might use the coordinates of the points to work out one of the terms in the equation of the line that is shown (you have to figure out *which* term!)
6. Now your task is to figure out how to work the other term in the equation of the line....!
7. You can test yourself on how successful you have been with the tasks in questions 5 and 6 by correctly predicting the equation of the lines that go through the pairs of points that are listed below.

Do this on paper first, then use the CabriJr file HG013 to see if you were correct.

If you want to sketch graphs like those in question 3 to help you, then that's fine.

Please note that this is a *tough* challenge that will require you take your time - do not expect to just write down the equations without some form of sketch or calculation.

- a) (-1, 4) and (3, 6)
 - b) (-2, 3) and (4, 2)
 - c) (2, 1) and (3, 4)
8. Now, you pick two points and see if you end up making one that's harder than what you've just tried, or easier.
What makes questions like this 'harder'?