

Three ways to display a linear function

Answer these questions in your grid book or on your grid paper.

Every function can be represented :-

pictorially, as a **graph** numerically, as a **table** algebraically, as an **equation**

For linear functions, given any one of these, we need to be able to find the other two.

1. Make a **table** and draw the **graph** of these functions, for x between -3 and 3 .

a. $y = 2x - 4$

c. $y = \frac{1}{2}x + 1$

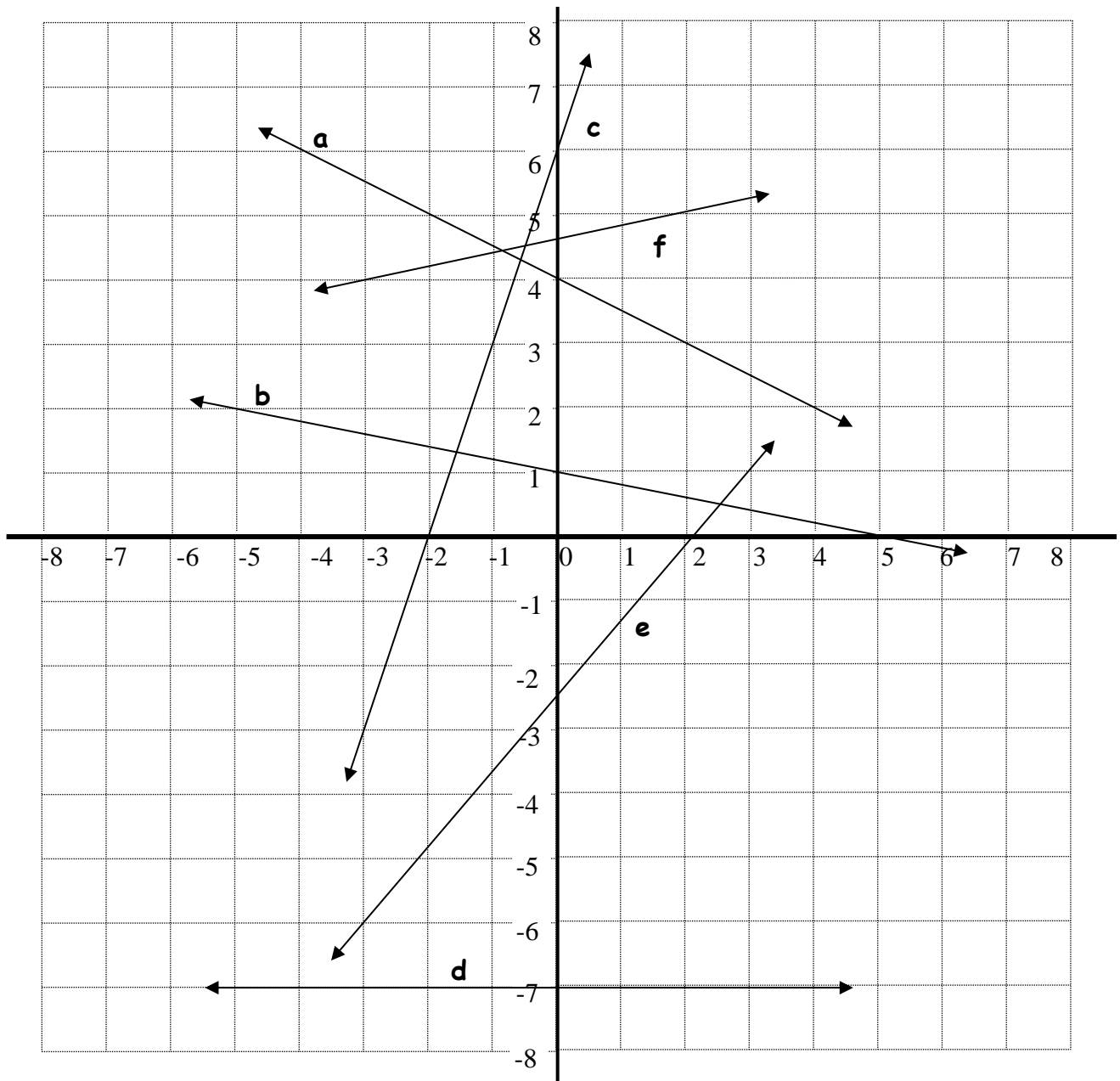
e. $y = 5x$

b. $y = 4 - x$

d. $y = -x + 3$

f. $y = -1$

2. For each graph below, make a **table** of x - and y -coordinates. For each graph, find the gradient and y -intercept and hence find the **equation**.



3. From the table, plot the points and hence draw the **graph**. From the graph, find the gradient and y-intercept and hence find the **equation**. Plot a **maximum of 3** graphs on each set of axes.

a.

x	-3	-1	0	1	3
y	-4	-2	-1	0	2

d.

x	-3	-1	0	1	3
y	8	6	5	4	2

b.

x	-3	-1	0	1	3
y	-8	2	1	4	10

e.

x	-4	-2	0	2	4
y	-1	0	1	2	3

c.

x	-3	-1	0	1	3
y	5	5	5	5	5

f.

x	-6	-3	0	3	6
y	0	-1	-2	-3	-4

- 4a. On the same set of axes, draw 3 lines each with a gradient of -2.
 b. Find the equation of each of these lines.
 c. On the same set of axes, draw 3 lines, each with a y-intercept of 3.
 d. Find the equation of each of these lines.
5. Make a **table**, for x between 0 and 5. Choose a suitable scale for the y-axis. Draw the **graph** of each function. Draw only one graph on each set of axes. Label the axes clearly.

a. $y = 20x - 30$

b. $y = -40x + 15$

c. $y = 2000 - 5000x$

- 6a. On the same set of axes, draw the graphs of these three equations.
 a. $y = 3$ b. $y = -2$ c. $y = 0$
 b. What is the gradient of each line?

- 7a. On the same set of axes, draw the graphs of these three equations.
 a. $x = 3$ b. $x = -1$ c. $x = 0$
 b. What is the gradient of each line?

Challenge

Write the equations of five lines that pass through $(2,1)$.

A line passes through the point $(2,1)$. What might be its equation?

Bill has \$600, is saving nothing, and is spending about \$20 a week on his new girl friend, Amber.

His sister, Sue, only has only \$100, but saves an additional \$30 a week. Let the students generate questions about the financial future of Bill and Sue. "How much would each have one week later?" etc.

Eventually one of your brighter students will ask, "when will Sue have more money than Bill?" Now let them crunch the numbers by adding and subtracting. Let them get the same answer by graphing, and finally let them come up with the algebraic equation.

These problems can easily be extended by asking, "when will Sue have twice as much money as Bill", etc.

1. Draw a line graph showing the number of buses needed to transport 200 students, if each bus holds 30 students.