

Algebra 1F Assessment

THE ANSWERS

Foundation Level



All questions

Clip	Grade	Title of clip	Question(s)	Marked out of	Score	%
7.....	1.....	Algebraic conventions.....	1 - 2	8	___	___
8.....	1.....	Coordinates.....	3	6	___	___
33.....	2.....	Simplifying - Addition and Subtraction.....	4 - 6	12	___	___
34.....	2.....	Simplifying - Multiplication.....	7 - 9	10	___	___
35.....	2.....	Simplifying - Division.....	10 - 12	8	___	___
36.....	2.....	Function Machines.....	13	4	___	___
37.....	2.....	Generating a Sequence - Term to Term.....	14 - 15	6	___	___
93.....	3.....	Expanding Brackets.....	16	8	___	___
94.....	3.....	Simple Factorisation.....	17	10	___	___
95.....	3.....	Substitution.....	18 - 21	16	___	___
96.....	3.....	Straight Line Graphs.....	22 - 23	8	___	___
97.....	3.....	The Gradient of a Line.....	24 - 25	6	___	___
98.....	3.....	Drawing Quadratic Graphs.....	26	6	___	___
99.....	3.....	Sketching Functions.....	27	2	___	___
100.....	3.....	Solving Equations using Flowcharts.....	28	4	___	___
101.....	3.....	Subject of a Formula using Flowcharts.....	29	2	___	___
102.....	3.....	Generating a Sequence from the n th Term.....	30	4	___	___
103.....	3.....	Finding the n th Term.....	31	2	___	___
104.....	3.....	Special Sequences.....	32 - 33	3	___	___

Out of 125 TOTAL SCORE _____

Final Percentage %

1) Write the following in their simplest forms using algebraic notation:

a) $9 \times x = \underline{9x}$ 1

b) $x \times 7 = \underline{7x}$ 1

c) $x \div 5 = \underline{\frac{x}{5}}$ 1

d) $x + x + x + x = \underline{4x}$ 1

2) Write the following using algebraic notation:

a) I think of a number, multiply it by 3 and then subtract 2.

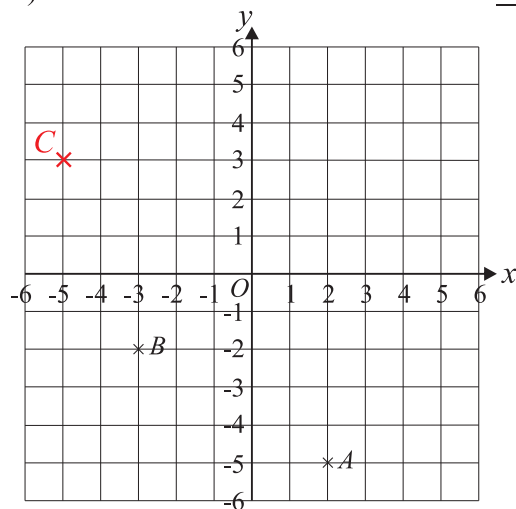
$\underline{3x - 2}$ 2

b) I think of a number, add 2 and then multiply the result by 6.

$\underline{6(x + 2)}$ 2

3) a) Write down the coordinates of A. $\underline{(2, -5)}$ 2

b) Write down the coordinates of B. $\underline{(-3, -2)}$ 2



c) Plot the point (-5, 3) and label it C. 2

4) Simplify the following:

a) $2x + 5x = \underline{7x}$ 1

b) $7y - 4y = \underline{3y}$ 1

c) $3x + x = \underline{4x}$ 1

d) $2x - 8x + 3x = \underline{-3x}$ 1

5) Simplify the following:

a) $4xy^2 + 2xy^2 = \underline{6xy^2}$ 1

b) $2x^2y^3 - 7x^2y^3 + 6x^2y^3 = \underline{x^2y^3}$ 1

6) Simplify the following:

a) $2x + 5y + 4x + 3y = \underline{6x + 8y}$ 2

b) $8x + 4y - 7x - y = \underline{x + 3y}$ 2

c) $3x - 5y - x - 6y = \underline{2x - 11y}$ 2

7) Simplify the following:

a) $x \times x \times x = \underline{x^3}$ 1

b) $x^2 \times x^5 = \underline{x^7}$ 1

c) $2x \times 4x = \underline{8x^2}$ 1

d) $3x^2 \times 2x^5 = \underline{6x^7}$ 1

e) $x \times 2x^3 \times 4x^2 = \underline{8x^6}$ 1

8) Simplify the following:

a) $7 \times 4t = \underline{28t}$ 1

b) $3xy^2 \times 4x^3y^5 = \underline{12x^4y^7}$ 1

9) Simplify the following:

a) $(x^3)^2 = \underline{x^6}$ 1

b) $(x^5)^4 = \underline{x^{20}}$ 1

c) $(2x^4)^3 = \underline{8x^{12}}$ 1

10) Simplify the following:

a) $x^5 \div x^3 = \underline{x^2}$ 1

b) $\frac{x^5 \times x^3}{x^2} = \underline{x^6}$ 1

c) $\frac{x^4 \times x^7}{x^2 \times x^3} = \underline{x^6}$ 1

11) Simplify the following:

a) $12x^5 \div 3x = \underline{4x^4}$ 1

b) $\frac{14x^7}{2x^3} = \underline{7x^4}$ 1

c) $\frac{5x^2 \times 4x^3}{10x^4} = \underline{2x}$ 1

12) Simplify the following:

a) $\frac{(x-3)^3}{(x-3)} = \underline{(x-3)^2}$ 1

b) $\frac{12(2x+3)^6}{2(2x+3)^4} = \underline{6(2x+3)^2}$ 1

13) Complete the table for this function machine:



In	Out	
1	5	1
5	17	1
9	29	1
x	$3x + 2$	1

14) Write the first three terms of each sequence using the following rules:

a) Start at 4 and add 5. 4, 9, 14 2

b) Start at 1 and subtract 7. 1, -6, -13 2

15) Find the term to term rule for these sequences:

a) 7, 9.5, 12, 14.5, 17
Add 2.5 1

b) -3, -5, -7, -9, -11
Subtract 2 1

16) Expand the following:

a) $2(4x - 3) = \underline{8x - 6}$ 2

b) $x(x + 7) = \underline{x^2 + 7x}$ 2

c) $2x(5x + 3) = \underline{10x^2 + 6x}$ 2

d) $4x(6x - 5y) = \underline{24x^2 - 20xy}$ 2

17) Factorise fully:

a) $2x + 20 = \underline{2(x + 10)}$ 2

b) $9x + 12 = \underline{3(3x + 4)}$ 2

c) $x^2 - 7x = \underline{x(x - 7)}$ 2

d) $3x^2 + 2x = \underline{x(3x + 2)}$ 2

e) $8x^4y + 2x^3 = \underline{2x^3(4xy + 1)}$ 2

18) If $x = 6$, find the value of:

a) $2x = \underline{12}$ 1

b) $x^2 = \underline{36}$ 1

c) $5 + 4x = \underline{29}$ 1

d) $3x - 20 = \underline{-2}$ 1

19) If $x = 5$ and $y = -3$, find the value of:

a) $2x + y = \underline{7}$ 2

b) $3x - y = \underline{18}$ 2

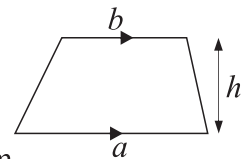
c) $2x^2 = \underline{50}$ 2

d) $x^2 + 2y^2 = \underline{43}$ 2

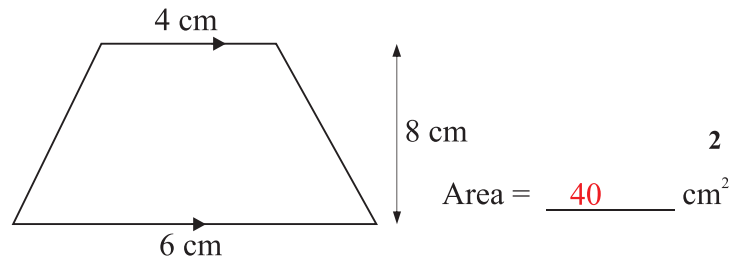
20) The cost, £ C , of hiring a carpet cleaner for d days is given by $C = 5d + 10$. Bill hires the cleaner for 6 days.

How much does it cost him? £40 2

21) The area of a trapezium is given by $A = \frac{1}{2}(a + b)h$



Find the area of this trapezium

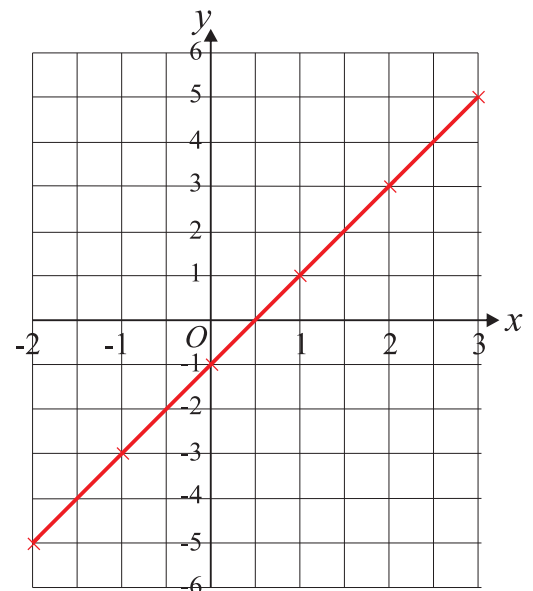


22) a) Complete the table of values for $y = 2x - 1$

x	-2	-1	0	1	2	3
y	<u>-5</u>	-3	<u>-1</u>	<u>1</u>	<u>3</u>	5

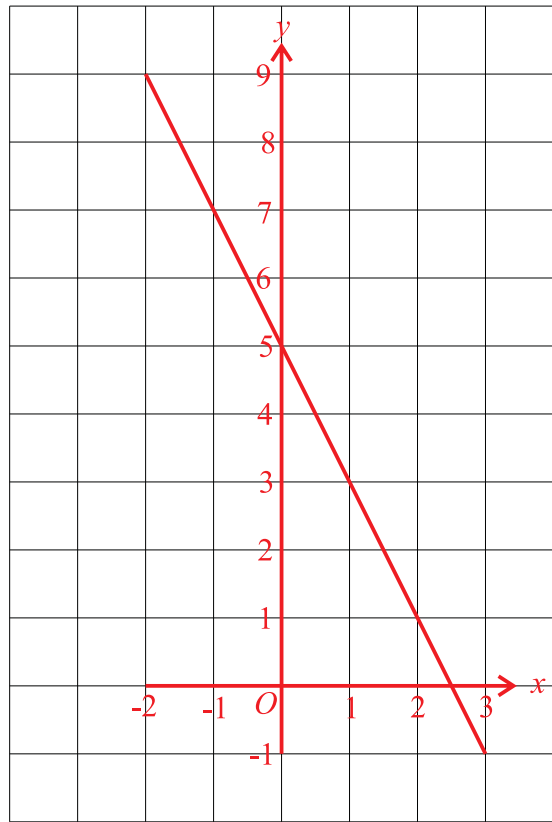
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b) Draw the graph of $y = 2x - 1$ 2



23) On the grid, draw the graph of $2x + y = 5$ for values of x between -2 and 3.

4



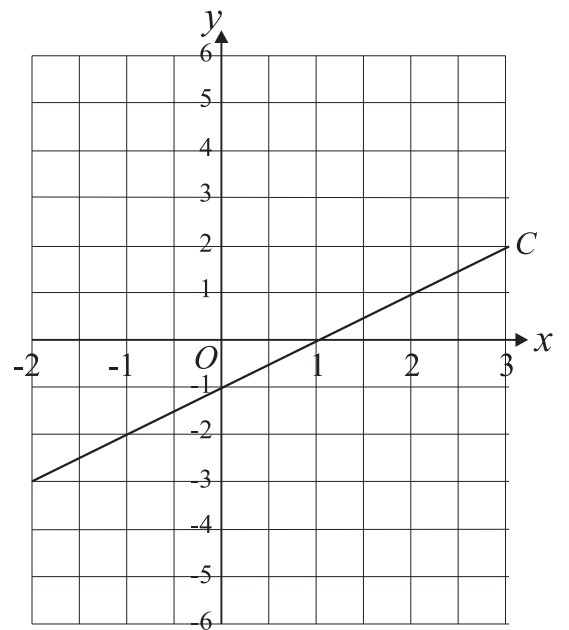
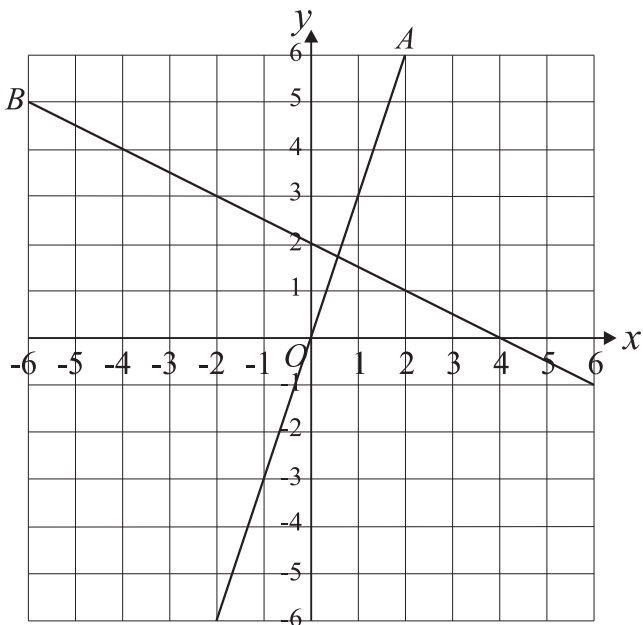
24) Find the gradients of lines A and B .

a) Gradient of A is 3 2

b) Gradient of B is -0.5 2

25) Find the gradient of line C .

Gradient of C is 1 2

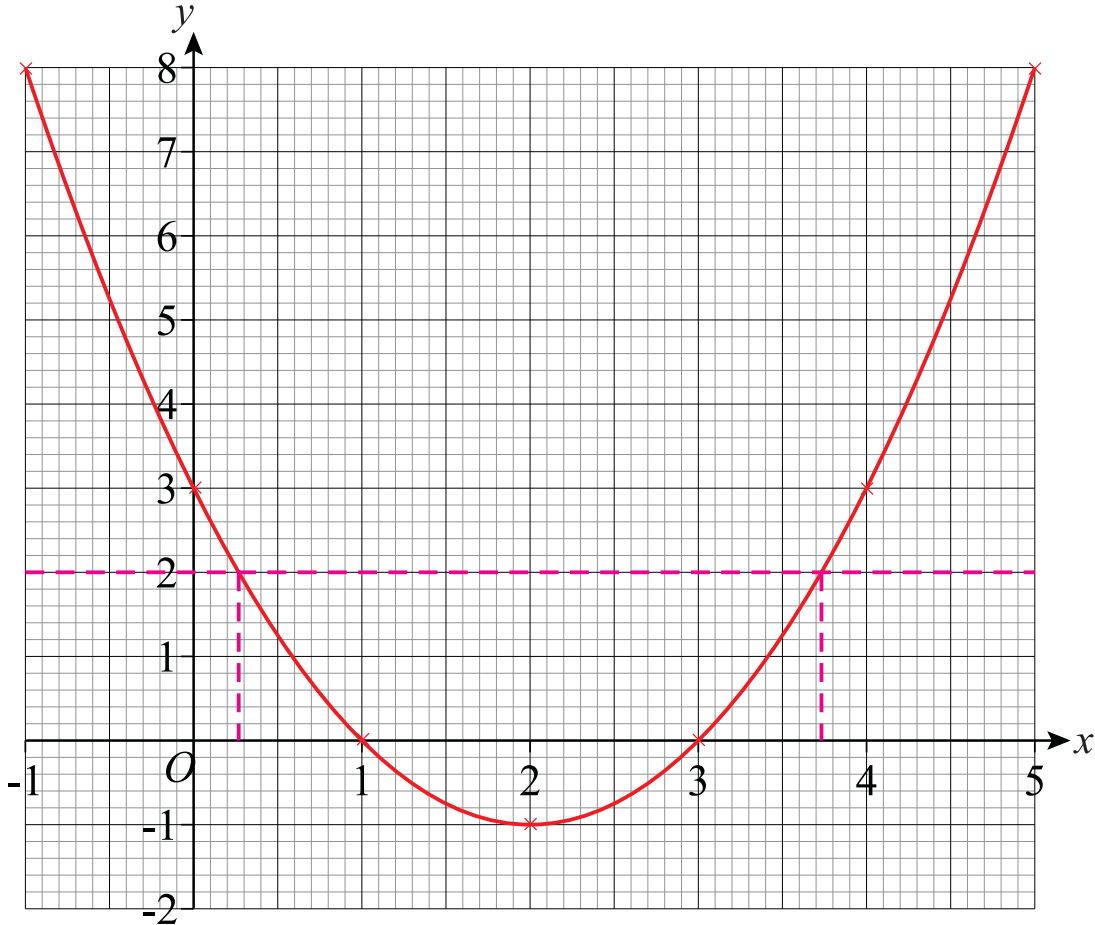


26) a) Complete the table of values for the equation $y = x^2 - 4x + 3$

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

2

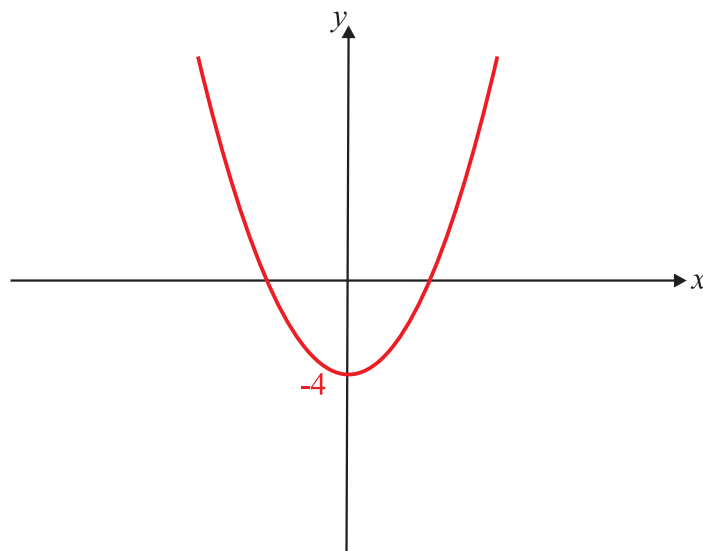
b) Draw the graph of $y = x^2 - 4x + 3$ 2



c) Using your graph, solve $x^2 - 4x + 3 = 2$

$x = \underline{0.27}$ or $x = \underline{3.73}$ 2

27) On the axes below, sketch the graph of $y = x^2 - 4$ 2



28) Using a flowchart, or otherwise, solve the following equations:

a) $2(4x - 1) = 26$

$x = \underline{3.5} \quad 2$

b) $4\left(\frac{x}{5} + 3\right) = 32$

$x = \underline{25} \quad 2$

29) Rearrange the formula $w = 5\left(\frac{x}{2} - y\right)$ to make x the subject.

$x = \underline{2\left(\frac{w}{5} + y\right)} \quad 2$

30) a) The n th term of a number sequence is $5n - 3$

Write down the 7th term of the sequence 32 2

b) The n th term of a number sequence is $3n^2 - 4$

Write down the 10th term of the sequence 296 2

31) Here are the first five terms of an arithmetic sequence:

7, 11, 15, 19, 23

Find an expression for the n th term of this sequence. $4n + 3$ 2

32) Here are the first five terms of a number sequence:

80, 40, 20, 10, 5

What is the term to term rule for this sequence? $\div 2$ 1

33) The n th term for triangular numbers is $\frac{n(n+1)}{2}$

Use this to work out the 6th triangular number. 21 2