

# Paper Reference AAL20/01

## Pearson Edexcel Award

Total Marks
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# Algebra

## Level 2

### Calculator NOT allowed

Time: 1 hour 30 minutes plus your additional time allowance

In the boxes below, write your name, centre number and candidate number.

Surname					
Other names					
Centre Number					
Candidate Number					

**YOU MUST HAVE**

**Ruler, writing and drawing equipment.**

**YOU WILL BE GIVEN**

**Diagram Booklet**

**INSTRUCTIONS**

**Answer ALL questions.**

**Answer the questions in the spaces provided in this Question Paper or on the separate diagrams – there may be more space than you need.**

**CALCULATORS ARE NOT ALLOWED.**

**Turn over**

## **INFORMATION**

**The total mark for this paper is 80**

**The marks for EACH question are shown in brackets – use this as a guide as to how much time to spend on each question.**

**There may be spare copies of some diagrams in case you need them.**

## **ADVICE**

**Read each question carefully before you start to answer it.**

**Try to answer every question.**

**Check your answers if you have time at the end.**

**Answer ALL questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**You must NOT use a calculator.**

1. (a) Simplify

$$4e + 3f - 2e + f + f$$

(1 mark)

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(continued on the next page)

**Turn over**

**1. continued.**

**(b) Simplify**

$$3 \times d \times 2c \times 5 \times d \times d$$

**(2 marks)**

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**(continued on the next page)**

**Turn over**

**1. continued.**

**(c) Simplify**

$$(x^2)^3$$

**(1 mark)**

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**(continued on the next page)**

**Turn over**

**1. continued.**

**(d) Simplify**

$$3a \times (2a)^2$$

**(2 marks)**

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**(continued on the next page)**

**Turn over**



**1. continued.**

**(e) Simplify**

$$8w^3 \div 2w$$

**(2 marks)**

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**(Total for Question 1 is 8 marks)**

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**Turn over**

**2. Look at the table for Question 2 in the Diagram Booklet.**

**Mark the appropriate column of the table to show whether the information in each row is an equation or an expression or a formula.**

**(Total for Question 2 is 3 marks)**

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**3. Simon wants to change  $n$  kilometres into miles.**

**He uses this rule**

**Divide the number of kilometres by 8  
then multiply by 5**

**Write an expression, in terms of  $n$ ,  
for the number of miles in  
 $n$  kilometres.**

**(1 mark)**

**Answer space continues on the next  
page.**

**3. continued.**

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**(Total for Question 3 is 1 mark)**

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**Turn over**

4.  $C = \frac{2d}{7}$

- (a) (i) Work out the value of **C**  
when **d = 14**  
(2 marks)

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(continued on the next page)

Turn over

4. (a) continued.

Remember:

$$C = \frac{2d}{7}$$

(ii) Work out the value of  $d$   
when  $C = 10$   
(2 marks)

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(continued on the next page)

Turn over

**4. continued.**

$$g = 4(h + f) + 7$$

**(b) Make  $h$  the subject of the formula.**

**(3 marks)**

**Answer space continues on the next page.**

**4. (b) continued.**

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**(Total for Question 4 is 7 marks)**

---

**Turn over**



**5. Look at the diagram for Question 5 in the Diagram Booklet.**

**It shows a graph that can be used to change between UK pounds (£) and Indian rupees.**

**(a) Change £150 into rupees.  
(3 marks)**

\_\_\_\_\_ rupees

**(continued on the next page)**

**Turn over**

**5. continued.**

**(b) Work out the gradient of the line.**

**(2 marks)**

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**(continued on the next page)**

**Turn over**

**5. continued.**

**(c) What does the gradient of this line represent?**

**(1 mark)**

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**(Total for Question 5 is 6 marks)**

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6. (a) Complete the table of values below for

$$y = 4 - x$$

There are five spaces to fill.

(2 marks)

Space for working is on the next page.

x	y
−3	
−2	6
−1	
0	4
1	
2	
3	

Turn over

**6. (a) continued.**

**(continued on the next page)**

**Turn over**

**6. continued.**

**(b) Look at the diagram for  
Question 6(b) in the  
Diagram Booklet.**

**It shows a grid.**

**On the grid, draw the graph of  
 $y = 4 - x$  for values of  $x$  from  
 $-3$  to  $3$**

**(2 marks)**

**(Total for Question 6 is 4 marks)**

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7. (a) Solve

$$x - 4 = 8$$

(1 mark)

$$x = \underline{\hspace{10cm}}$$

(continued on the next page)

**Turn over**

**7. continued.**

**(b) Solve**

$$3y + 2 = 11$$

**(2 marks)**

**$y =$  \_\_\_\_\_**

**(continued on the next page)**

**Turn over**



**7. continued.**

**(c) Solve**

$$5m - 11 = m + 3$$

**(2 marks)**

**m = \_\_\_\_\_**

**(continued on the next page)**

**Turn over**

**7. continued.**

**(d) Solve**

$$\frac{2(9n + 3)}{5} = 3(n - 2)$$

**(3 marks)**

**Answer space continues on the  
next page.**

7. (d) continued.

$n =$  \_\_\_\_\_

**(Total for Question 7 is 8 marks)**

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**Turn over**

8. (a) Look at the diagram for Question 8(a) in the Diagram Booklet.

It shows a set of axes.

Using the axes, sketch the graph of

$$y = x^2 + 3$$

(2 marks)

(continued on the next page)

**8. continued.**

**(b) For  $y = x^2 + 3$ , describe what happens to the value of  $y$  as the value of  $x$  becomes very large.**

**(1 mark)**

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**(Total for Question 8 is 3 marks)**

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**Turn over**

9. (a) Complete the table of values below for

$$y = x^2 - 3x - 2$$

There are six spaces to fill.

(2 marks)

Space for working is on the next page.

x	y
-2	
-1	
0	
1	
2	
3	

Turn over

**9. (a) continued.**

**(continued on the next page)**

**Turn over**

**9. continued.**

**(b) Look at the diagram for  
Question 9(b) in the  
Diagram Booklet.**

**It shows a grid.**

**On the grid, draw the graph of  
 $y = x^2 - 3x - 2$  for values of  $x$   
from  $-2$  to  $3$**

**(2 marks)**

**(continued on the next page)**



**9. continued.**

**(c) Use your graph to find an estimate for one of the solutions of**

$$\mathbf{x^2 - 3x - 2 = 6}$$

**(2 marks)**

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**(Total for Question 9 is 6 marks)**

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- 10. (a) Expand**  
 **$7(p - 3)$**   
**(1 mark)**

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**(continued on the next page)**

**10. continued.**

**(b) Expand and simplify**

$$2x(x - y) + y(x - 2)$$

**(2 marks)**

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**(Total for Question 10 is 3 marks)**

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**Turn over**

**11. Look at the diagram for Question 11 in the Diagram Booklet.**

**It shows a grid.**

**Charlotte drove for 40 kilometres at a constant speed of 80 kilometres per hour.**

**On the grid in the Diagram Booklet, draw a speed–time graph for this journey.**

**(Total for Question 11 is 3 marks)**

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**12. (a) Factorise**

$$12 + 8k$$

**(2 marks)**

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**(continued on the next page)**

**Turn over**

**12. continued.**

**(b) Factorise**

$$3t^2 - 9t$$

**(2 marks)**

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**(continued on the next page)**

**Turn over**

**12. continued.**

**(c) Factorise**

$$xy^3 + x^2y^2$$

**(2 marks)**

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**(Total for Question 12 is 6 marks)**

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**Turn over**

**13.  $x > 2$**

**X is an integer.**

- (a) Write down the least possible  
value of X  
(1 mark)**
- 

**(continued on the next page)**

**Turn over**



**13. continued.**

**(b) Look at the diagram for  
Question 13(b) in the  
Diagram Booklet.**

**It shows a number line.**

**On the number line in the  
Diagram Booklet, show the  
inequality  $-3 < y \leq 4$   
(2 marks)**

**(continued on the next page)**

**13. continued.**

**Look at the diagram for  
Question 13(c) in the  
Diagram Booklet.**

**It shows an inequality, in  $x$ , shown  
on a number line.**

**(c) Write down the inequality.  
(1 mark)**

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**(continued on the next page)**

**Turn over**

**13. continued.**

**(d) Solve the inequality**

$$\frac{4r}{3} + 2 > 8$$

**(3 marks)**

**Answer space continues on the  
next page.**

**13. (d) continued.**

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**(Total for Question 13 is 7 marks)**

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**Turn over**

**14. Look at the diagram for Question 14 in the Diagram Booklet.**

**It shows a graph.**

**Farah turns on a tap at her sink.**

**The sink fills for a time  $T$  seconds, at which time Farah turns off the tap.**

**Farah then puts a bowl into the sink.**

**Later she removes the bowl from the sink so that no water is lost from the sink.**

**The sink is then emptied.**

**(continued on the next page)**

**14. continued.**

**The graph in the Diagram Booklet shows information about the depth of the water in the sink.**

**(a) Write T in its correct place on the time axis.**

**(1 mark)**

**(continued on the next page)**

**14. continued.**

**The time taken to empty the sink is  
U seconds so that  $T = kU$**

**(b) Find the value of k  
(1 mark)**

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**(Total for Question 14 is 2 marks)**

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**Turn over**

**15. Look at the diagram for Question 15 in the Diagram Booklet.**

**It shows a straight line L drawn on a grid.**

**Find an equation for L**

**(2 marks)**

**Answer space continues on the next page.**



**15. continued.**

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**(Total for Question 15 is 2 marks)**

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**Turn over**

**16. The  $n$ th term of an arithmetic sequence is given by the expression  $3n - 2$**

**(a) Work out the 7th term of this sequence.**

**(2 marks)**

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**(continued on the next page)**

**Turn over**

**16. continued.**

**The  $m$ th term of this sequence is 97**

**(b) Work out the value of  $m$**   
**(2 marks)**

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**(continued on the next page)**

**Turn over**

**16. continued.**

**Below are the first four terms of a different arithmetic sequence.**

**12          16          20          24**

**(c) Find an expression, in terms of  $n$ , for the  $n$ th term of this sequence.**

**(2 marks)**

**Answer space continues on the next page.**

**Turn over**

**16. (c) continued.**

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**(Total for Question 16 is 6 marks)**

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**Turn over**

**17. Look at the diagram for Question 17 in the Diagram Booklet.**

**It shows a grid.**

**Saira and Fred live 5 km from a leisure centre.**

**Saira left home at 10 00 to walk to the leisure centre.**

**On the way to the leisure centre she stopped to talk to a friend.**

**The distance–time graph for her journey to the leisure centre is shown on the grid in the Diagram Booklet.**

**(continued on the next page)**

**Turn over**

**17. continued.**

**(a) For how many minutes did Saira  
stop to talk to her friend?**

**(1 mark)**

**\_\_\_\_\_minutes**

**(continued on the next page)**

**Turn over**

**17. continued.**

**(b) Work out the speed at which  
Saira walked.**

**(2 marks)**

\_\_\_\_\_ **km/h**

**(continued on the next page)**

**Turn over**



**17. continued.**

**Fred also left home at 10 00 to go to the leisure centre.**

**He jogged to the leisure centre at a constant speed of 10 km/h**

**When Fred got to the leisure centre, he waited until Saira arrived.**

**(c) On the grid in the Diagram Booklet, draw the distance–time graph for this information.**

**(2 marks)**

**Space for working is on the next page.**

**Turn over**

**17. (c) continued.**

**(Total for Question 17 is 5 marks)**

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**TOTAL FOR PAPER IS 80 MARKS**

**END OF PAPER**

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