

# Pi Academy

## YEAR 5

### Algebra

### Assessment - 1

#### Instructions:

1. The time allowed is 20 minutes for 20 questions
2. Follow the instructions and work as quickly and as carefully as you can.
3. If you need to do working out, you can use the space around the question.
4. The number under each question at the right side of the page tells you the number of marks available for each question.
5. No Marks are lost for an incorrect answer.
6. If you have written the wrong answer, erase it and write the new one. Make sure that your final answer is clear.

Total Marks	Marks Achieved (To be filled by Parent/Teacher)
25 Marks	

Symbols used:



Go to the next page.

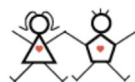


Do not turn the page until told to do so.



Stop working and await instructions.

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Important Topics Assessed for Algebra	Questions	Marks
express missing number problems algebraically	1, 4, 14, 15	5 Marks
use simple formulae	2, 5, 12, 19	4 Marks
generate and describe linear number sequences	3, 8, 11, 16	5 Marks
find pairs of numbers that satisfy an equation with two unknowns	6, 10, 13, 17	6 Marks
enumerate possibilities of combinations of two variables	7, 9, 18, 20	5 Marks

Total - 

25 Marks
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1

Sammy got £100 on his birthday from his Gran and got money as a prize at his annual function. How much did he receive as a prize if he ended up with £230?

£

1 Mark

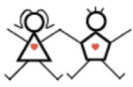
2

Complete the function table for the total cost of a day out at Trafford centre. You must pay an entry fee of £24 and purchase a shopping bag for the shop that you want to go in.

Shopping bag	5 shopping bags for £20	6 shopping bags for £24	7 shopping bags for £28	8 shopping bags for £32
Total Cost				
Rule	Shopping bags + £24 = Total Cost			

1 Mark



**3**

Use a calculator to work out where each pattern started to go wrong in these single operation patterns and circle then.

Hint: The first two numbers in both are correct.

a) 

156	200	244	288	332	376	421	444	455
-----	-----	-----	-----	-----	-----	-----	-----	-----

b) 

1000	966	932	898	864	830	798	766	730
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**1 Mark**



4

For each question, write an equation using the variable  $x$  for the mystery number, then solve it.

a) The sum of 14 and a mystery number is 52.

b) A mystery number increased by 30 is 96.

c) A mystery number doubled is 128.

d) The difference between a mystery number and 38 is 84.

2 Marks





5

Find the value of the symbols and then check if you are right by using the same value in the question alongside it.

a)  $\diamond \times \diamond = 169$

$$\diamond = \square$$

$$\diamond \times \triangle = 78$$

$$\triangle = \square$$

b)  $\bigcirc + \star + \star = 40$

$$\bigcirc = \square$$

$$\bigcirc \times \star = 102$$

$$\star = \square$$

1 Mark

6

Find the value of X and Y. First find the value of X, then find the value of Y. Show your working out.

a)  $X - 30 = 70$  and  $X \times Y = 500$

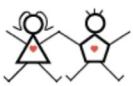
$$X = \square \quad Y = \square$$

b)  $X \times 18 = 144$  and  $X \times Y = 96$

$$X = \square \quad Y = \square$$

1 Mark





7

Three boxes contain  $a$  cupcakes and two boxes contain  $b$  cupcakes. There are a total of 56 cupcakes in all five boxes and this can be written as  $3a + 2b = 56$ .

If  $4b = a$ , what is the value of  $b$ ?

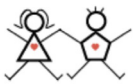
2 Marks

8

Ben is given £10 by his father which he puts into his piggy bank. His sister puts £4 in the piggy bank every day during September. On the 1<sup>st</sup> of September, there is £14 in the piggy bank. Calculate how many pounds are in the piggy bank at the end of September.

2 Marks





9

Five cards numbered 6 to 10 are placed face down in front of Suzan. She chooses two cards and calls them  $x$  and  $y$ . The product of her two cards is 54.

If  $y$  is larger than  $x$ , what is the value of  $y$ ?

6	7	8	9	10
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1 Mark

10

Two consecutive numbers multiply to give 72. What are these two numbers? There are two unknowns but we know their product and that they are consecutive.

1 Mark





**11**

Complete the following number patterns and write the rule as two operations in the grey boxes.

a)  $2 \rightarrow \begin{array}{|c|} \hline \times \_ + \_ \\ \hline \end{array} \rightarrow 6 \rightarrow \begin{array}{|c|} \hline \times \_ + \_ \\ \hline \end{array} \rightarrow 14 \rightarrow \begin{array}{|c|} \hline \times \_ + \_ \\ \hline \end{array} \rightarrow 30$

b)  $4 \rightarrow \begin{array}{|c|} \hline \times \_ - \_ \\ \hline \end{array} \rightarrow 9 \rightarrow \begin{array}{|c|} \hline \times \_ - \_ \\ \hline \end{array} \rightarrow 24 \rightarrow \begin{array}{|c|} \hline \times \_ - \_ \\ \hline \end{array} \rightarrow 69$

1 Mark

**12**

A toy costs £7 and a book costs £y. The total cost of the toy and book is £15.

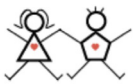
a) Write this information as an equation.

b) What is the cost of a book?

£ 

1 Mark





13

Martha goes to a stationary store and buys 3 books and 2 pens for herself and her brothers. Martha pays £18. How much could a book and pen cost? Write one possible solution.

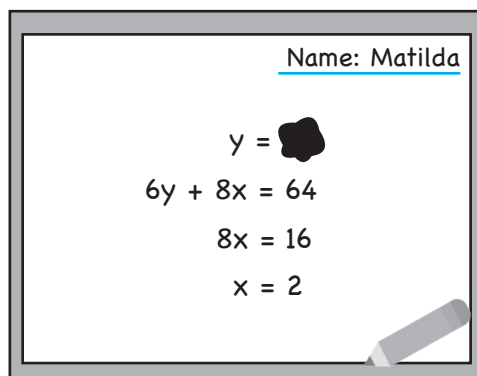
book = £

pen = £

2 Marks

14

Matilda has spilt ink on her maths project and can't see what the value of  $y$  was. Work out the value of  $y$ .



1 Mark



**15**

Match each equation to the correct bar model.

$$2x + 10 = 24$$

2x	2x	2x
24		

$$6x = 24$$

6	2x
24	

$$24 = 6 + 2x$$

2x	10
24	

1 Mark

**16**

These numbers make up two linear sequences.

2	2	6	3	10	5	14	7
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What are the two linear sequences?

1<sup>st</sup> \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_2<sup>nd</sup> \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_

1 Mark





17

Gwen is 16 years old.  
Henry is 26 years old.  
Father is  $a + 24$  years old.  
The sum of their ages is 100.  
Form and solve an equation to work out how old Father is.

years

2 Marks

18

Find the value of 3 different symbols using the clues in each step.

a)  $\star \times \star = 36$   
 $\diamond + \star = 140$   
 $\diamond - \star = \triangle$

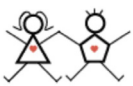
$\star =$    
 $\diamond =$    
 $\triangle =$

b)  $\triangle + \triangle = 100$   
 $\triangle \div \diamond = 10$   
 $\diamond + \triangle = \star$

$\star =$    
 $\diamond =$    
 $\triangle =$

1 Mark



**19**

Hannah thinks of a number. She adds 14 and divides her answer by 4.

Ben thinks of a number. He multiplies by 6 and subtracts 8.

Hannah and Ben think of the same number.

Hannah's answer is 18.

What is Ben's answer?

1 Mark

**20**

Choose values of  $x$  and use the equation to work out the values of  $y$ .

$$14x + 8 = y$$

Value of $x$	Value of $y$

1 Mark

**END OF THE TEST**