

Identities and Algebraic Arguments

For Pearson Edexcel GCSE Mathematics (1MA1) • Foundation tier

Name _____

Total marks: **25**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

1 Tick the statement that is an identity.

$$3x + 1 = 10$$

$$x^2 - 9 \equiv (x - 3)(x + 3)$$

$$y = 2x + 5$$

$$4x > 12$$

Tick

☐☐☐☐

(1)

(Total for Question 1 is 1 mark)

2 Show that $5(x + 3) - 2(x + 4) \equiv 3x + 7$

(2)

(Total for Question 2 is 2 marks)

3 Show that $(x + 4)(x - 1) - 3x \equiv x^2 - 4$

(2)

(Total for Question 3 is 2 marks)

4 a and b are integers.

$$3(2x + a) - b(x - 1) \equiv 4x + 17$$

Find the value of a and the value of b .

$a = \dots\dots\dots b = \dots\dots\dots$
(3)

(Total for Question 4 is 3 marks)

5 $2x + 5$ $4x - 1$ $3x - 1$

Show that the mean of these three expressions is $3x + 1$

(2)

(Total for Question 5 is 2 marks)

- 6** n is a positive integer.
Ria says,
‘ $4n - 2$ is always an odd number.’

Explain why Ria is wrong.

(1)

(Total for Question 6 is 1 mark)

- 7** n is a whole number, so $2n + 1$ is an odd number.

(a) Write down, in terms of n , the next odd number after $2n + 1$

.....

(1)

- (b) Shreya says,
‘If you add any four consecutive odd numbers, the answer is always a multiple of 8’
Show that Shreya is correct.

(3)

(Total for Question 7 is 4 marks)

- 8 Show that the sum of any three consecutive integers is always a multiple of 3

(3)

(Total for Question 8 is 3 marks)

- 9 n is an integer.

Show that $(n + 2)(n + 6) - n(n + 4)$ is always a multiple of 4

(3)

(Total for Question 9 is 3 marks)

- 10** The diagram shows a rectangle.
All measurements are in centimetres.
The perimeter of the rectangle is P cm.

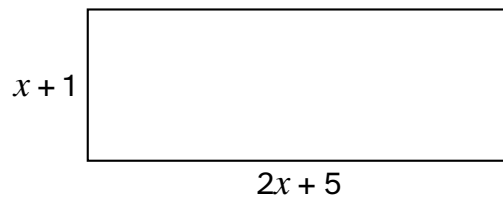


Diagram **NOT** accurately drawn

- (a) Show that $P = 6x + 12$

(2)

- (b) Jamal says,
‘When x is a whole number, P is always a multiple of 12’
Is Jamal correct?
You must give a reason for your answer.

(2)

(Total for Question 10 is 4 marks)
