2.6 Simplifying Algebra: Test Pack

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Simplify 5a + 3a

(Total for Question 1 is 1 mark)

2 Expand 5(2y - 3)

(Total for Question 2 is 2 marks)

3 Expand and simplify 4(a + 1) - 3

(Total for Question 3 is 2 marks)

4 A pen costs p pence. A pencil costs fifteen pence less than a pen.

(a) Write down an expression, in terms of p, for the cost of the pencil in pence. **(1)**

.....

(b) Write down and simplify an expression, in terms of p, for the total cost, in pence, of 3 pens and 2 pencils. **(2)**

.....

(Total for Question 4 is 3 marks)

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5 Which of these expressions is equivalent to 5a + 3a - 2a?

- ☐ A) 6a
- ☐ B) 10a
- ☐ C) 0
- ☐ D) 8a

(Total for Question 5 is 1 mark)

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6 Simplify $(x^7 \times x^3) / x$

(Total for Question 6 is 2 marks)

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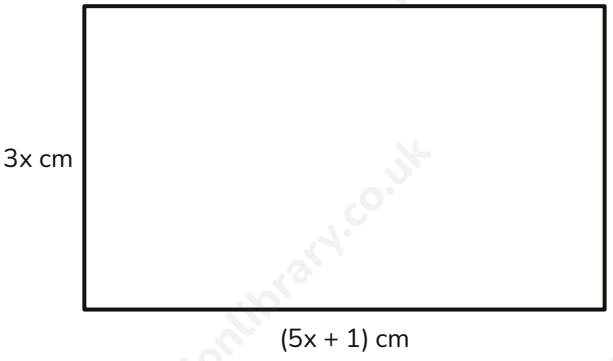
7 Simplify 6p + 3q - 2p + 5q

(Total for Question 7 is 2 marks)

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8 A rectangle has length (5x + 1) cm and width 3x cm. Write an expression, in its simplest form, for the perimeter of the rectangle.

Diagram NOT accurately drawn



(Total for Question 8 is 2 marks)

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9 A student was asked to simplify $5(2x - 3) + 4x$. Their working is shown below.

$5(2x - 3) + 4x = 10x - 3 + 4x = 14x - 3$

Identify the mistake in the student's working, and give the correct simplified expression.

(Total for Question 9 is 2 marks)

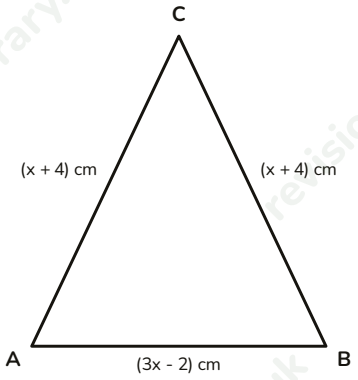
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10 Three consecutive integers can be written as n, n + 1 and n + 2. Write and simplify an expression, in terms of n, for the sum of three consecutive integers.

(Total for Question 10 is 2 marks)

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11 The diagram shows an isosceles triangle. The two equal sides are each (x + 4) cm and the base is (3x - 2) cm. Write down and simplify an expression, in terms of x, for the perimeter of the triangle.



(Total for Question 11 is 2 marks)

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12 Simplify $3a + 2 - a + 5$.

(Total for Question 12 is 1 mark)

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13 Priya has 4x football stickers. Her friend gives her 6x more stickers. Write down an expression, in its simplest form, for the number of stickers Priya has now.

(Total for Question 13 is 1 mark)

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14 The cost, C pounds, of hiring a bike for h hours is given by $C = 4(h + 3) - 2(h - 1)$

(a) Show that $C = 2h + 14$ **(2)**

(b) Hence, or otherwise, work out the cost of hiring the bike for 5 hours. **(1)**

(Total for Question 14 is 3 marks)

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15 Simplify fully $3x(x + 2) - 2x(x - 5)$

(Total for Question 15 is 3 marks)

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16 Expand and simplify $2(3x + 4)$.

(Total for Question 16 is 2 marks)

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17 Simplify $(2x)(3x)$.

(Total for Question 17 is 2 marks)

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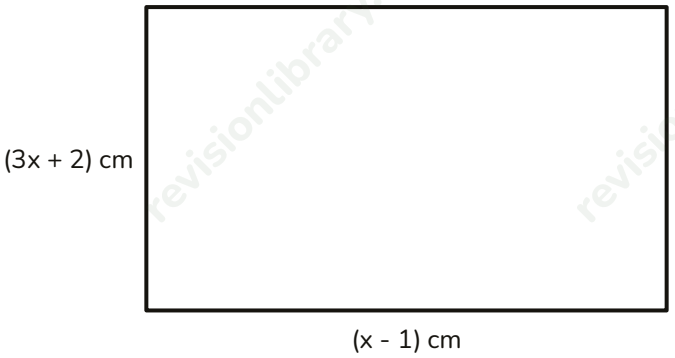
18 Show that $6t^0 = 6$ for any non-zero value of t.

(Total for Question 18 is 2 marks)

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19 A rectangle has length (3x + 2) cm and width (x - 1) cm. Find an expression, in its simplest form, for the perimeter of the rectangle.

Diagram NOT accurately drawn



(Total for Question 19 is 2 marks)

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20 Simplify $(1/2)x^3 * 4x^{-1}$.

(Total for Question 20 is 2 marks)

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21 Erin was asked to simplify $5x - 3(x - 2)$. Her working is shown below:

$5x - 3(x - 2) = 5x - 3x - 6 = 2x - 6$

The answer $2x - 6$ is incorrect. Explain the error in Erin's working and work out the correct simplified expression.

(Total for Question 21 is 2 marks)

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22 Simplify $(8x^{-3}\ y^{4}) / (2x^{2}\ y^{-1})$. Give your answer with positive indices.

(Total for Question 22 is 3 marks)

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Mark scheme · 2.6 Simplifying Algebra: Test Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

8a cao **B1**

Answer: 8a

Question 2

10y or -15 seen (one term correctly multiplied out) **M1**

10y - 15 oe cao **A1**

Answer: 10y - 15

Question 3

4a + 4 seen (bracket expanded correctly) **M1**

4a + 1 oe cao **A1**

Answer: 4a + 1

Question 4

(a) p - 15 oe cao **B1**

(a) Answer: p - 15

(b) 3p + 2(p - 15) oe seen (correct unsimplified expression) **M1**

(b) 5p - 30 oe cao **A1**

(b) Answer: 5p - 30

Question 5

A) 6a **B1**

Answer: A) 6a

Question 6

x^{10} or x^6 seen **M1**

x^9 cao **A1**

Answer: x^9

Question 7

4p or 8q seen (one pair of like terms correctly collected) **M1**

4p + 8q oe cao **A1**

Answer: 4p + 8q

Question 8

adds the length and width and doubles, or adds all four sides **M1**

(16x + 2) cm cao **A1**

Answer: (16x + 2) cm

Question 9

correctly identifies the error: the -3 was not multiplied by 5, so the constant term should be -15, not -3, oe **C1**

14x - 15 oe cao **B1**

Answer: Error: -3 was not multiplied by 5 (it should become -15). Correct answer: 14x - 15

Question 10

n + (n + 1) + (n + 2) oe seen **M1**

3n + 3 oe cao **A1**

Answer: 3n + 3

Question 11

(x + 4) + (x + 4) + (3x - 2) oe seen **M1**

5x + 6 oe cao **A1**

Answer: 5x + 6

Question 12

2a + 7 cao **B1**

Answer: 2a + 7 (cao)

Question 13

10x cao **B1**

Answer: 10x (cao)

Question 14

(a) 4h + 12 and -2h + 2 (or 2h - 2) seen (both brackets expanded correctly) **M1**

(a) 4h + 12 - 2h + 2 = 2h + 14 shown correctly, cso **A1**

(a) Answer: 2h + 14 (shown)

(b) 24 (pounds) ft from candidate's simplified formula, cao if 2h + 14 used **B1**

(b) Answer: £24

Question 15

$3x^2$ + 6x seen (first bracket correctly expanded) **M1**

$-2x^2$ + 10x seen (second bracket correctly expanded and subtracted) **M1**

x^2 + 16x oe cao **A1**

Answer: x^2 + 16x

Question 16

correct multiplication of both terms, e.g. 2*3x and 2*4 shown **M1**

6x + 8 cao **A1**

Answer: 6x + 8 (cao)

Question 17

multiply coefficients and use index law $x^1 * x^1 = x^2$ **M1**

$6x^2$ cao **A1**

Answer: $6x^2$ (cao)

Question 18

states or uses $t^0 = 1$ for t not equal to 0 **B1**

6 x 1 = 6 (cso) **B1**

Answer: 6 (shown, cso)

Question 19

correct method for perimeter, e.g. (3x + 2) + (x - 1) + (3x + 2) + (x - 1) or 2[(3x + 2) + (x - 1)] **M1**

8x + 2 cao (cm) **A1**

Answer: 8x + 2 (cm) (cao)

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Question 20

multiply coefficients (1/2)*4 = 2 and add indices 3 + (-1) = 2 **M1**

$2x^2$ cao **A1**

Answer: $2x^2$ (cao)

Question 21

identifies the error: -3 x (-2) = +6, not -6 (sign error when multiplying two negative numbers) oe **M1**

2x + 6 cao **A1**

Answer: Erin's error: -3 x (-2) = +6, not -6 (a sign error).
Correct answer: 2x + 6

Question 22

divide coefficients 8/2 = 4 and subtract indices for x: -3 - 2 = -5 **M1**

subtract indices for y: 4 - (-1) = 5, obtaining $4x^{-5}\ y^5$ **M1**

$4y^5 / x^5$ cao (positive indices) **A1**

Answer: $4y^5 / x^5$ (cao)

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