Algebraic Expressions: exam questions

10 questions · 23 marks · mark schemes at the end

Name _____ Date _____ Score / 23

- Calculators are allowed on both 4MA1 Higher papers (1H and 2H). Show your working: most marks are for method.
- Mark schemes start after the questions. M marks are for a correct method, A marks for an accurate answer that follows a correct method, and B marks for a correct result on its own.
- Online, with more practice: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/algebraic-expressions

1. **3 marks**

(a) Simplify $y^5 \times y^3$. **(1)**

(b) Simplify $(3x^4)^2$. **(2)**

2. **2 marks**

$$v^2 = u^2 + 2as$$

Work out the positive value of v when $u = 6$, $a = -2.5$ and $s = 4.8$. Give your answer correct to 3 significant figures.

3. **2 marks**

Simplify fully $\dfrac{4x^2y \times 3xy^3}{6x^2y^2}$.

4. **2 marks**

A rectangle has length $(3x + 2)$ cm and width $(x - 1)$ cm.

Show that the perimeter of the rectangle is $(8x + 2)$ cm.

5. **2 marks**

$T = 3p^2 - 2q$

Work out the value of T when $p = -4$ and $q = 5$.

6. **2 marks**

Expand and simplify $3(2x - 5) - 2(x - 4)$.

7. **4 marks**

Ella is x years old. Her brother is 3 years older than Ella. Their mother's age is twice the sum of their ages.

(a) Write an expression, in terms of x, for their mother's age. Simplify your answer. **(2)**

Their mother is 42 years old.

(b) Work out Ella's age. **(2)**

8. 2 marks

$$E = \frac{a^2 - b}{2c}$$

Work out the value of E when $a = -3$, $b = -6$ and $c = 0.75$.

9. 2 marks

Simplify fully $\frac{12a^5b^2}{4a^2b^5}$.

10. 2 marks

Work out the value of $2x^2 - 5x$ when $x = -1.5$.

Answers and worked solutions

Question 1 — 3 marks

(a)

B1 y^8

(b)

B2 $9x^8$

(b) B1 for $9x^n$ or kx^8.

Answer: (a) y^8; (b) $9x^8$

Question 2 — 2 marks

M1 $v^2 = 36 + 2 \times (-2.5) \times 4.8 = 12$

A1 $v = 3.46$

Answer: 3.46

Question 3 — 2 marks

M1 numerator $12x^3y^4$

A1 $2xy^2$

Answer: $2xy^2$

Question 4 — 2 marks

M1 $2(3x + 2) + 2(x - 1)$

A1 $6x + 4 + 2x - 2 = 8x + 2$ shown

Answer: shown

Question 5 — 2 marks

M1 $3 \times 16 - 10$

A1 38

Answer: 38

Question 6 — 2 marks

M1 $6x - 15 - 2x + 8$ (three of the four terms correct)

A1 $4x - 7$

Answer: $4x - 7$

Question 7 — 4 marks

(a)

M1 $2(x + x + 3)$

A1 $4x + 6$

(b)

M1 $4x + 6 = 42$

A1 9

Answer: (a) $4x + 6$; (b) 9 years old

Question 8 — 2 marks

M1 $\dfrac{9 + 6}{1.5}$

A1 10

Answer: 10

Question 9 — 2 marks

M1 two of 3, a^3, b^{-3} (or $\dfrac{1}{b^3}$)

A1 $\dfrac{3a^3}{b^3}$

Answer: $\dfrac{3a^3}{b^3}$

Question 10 — 2 marks

M1 $2 \times 2.25 + 7.5$

A1 12

Answer: 12

Online, with every solution: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/algebraic-expressions
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