The Laws of Exponents: Complete Exam Guide

MEMORANDUM

Name: ..... Class: .....

Date: .....

MARK ____ / 24

Answer all questions. Show all your working — marks are awarded for method as well as the final answer. **Teacher copy: accept any correct equivalent method.**

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1 Simplify $x^4 \cdot x^3$ *(Law 1)* (1)

> Add exponents → $\boldsymbol{x^7}$ ✓ (1)

2 Simplify $3a^2 \cdot 4a^5$ *(Law 1)* (2)

> $3 \times 4 = 12$, add exponents → $\boldsymbol{12a^7}$ ✓✓ (2)

3 Simplify $m^8 \div m^3$ *(Law 2)* (1)

> Subtract exponents → $\boldsymbol{m^5}$ ✓ (1)

4 Simplify $\frac{20x^6}{5x^2}$ *(Law 2)* (2)

> $20 \div 5 = 4$, subtract exponents → $\boldsymbol{4x^4}$ ✓✓ (2)

5 Simplify $(a^3)^2$ *(Law 3)* (1)

> Multiply exponents → $\boldsymbol{a^6}$ ✓ (1)

6 Simplify $(2y^4)^3$ *(Law 4)* (2)

> $2^3 = 8$, and the exponents multiply: $4 \times 3 = 12$ → $\boldsymbol{8y^{12}}$ ✓✓ (2)

7 Simplify $(3x^2)^2$ *(Law 4)* (2)

> $3^2 = 9$ → $\boldsymbol{9x^4}$ ✓✓ (2)

8 Evaluate $7x^0$, where $x \neq 0$ *(Law 5)* (1)

> $x^0 = 1$ → $\boldsymbol{7}$ ✓ (1)

9 Evaluate $(5y)^0$, where $y \neq 0$ *(Law 5)* (1)

> Whole bracket to power 0 → $\boldsymbol{1}$ ✓ (1)

10 Write $4x^{-2}$ with a positive exponent *(Law 6)* (2)

> $\frac{4}{x^2}$ ✓✓ (2)

11 Simplify $(2x^3)^2 \cdot x$ *(combined)* (2)

> $(2x^3)^2 = 4x^6$, $\times x \rightarrow \mathbf{4x^7}$ ✓✓ (2)

12 Simplify $\frac{12a^5b^2}{4a^2b^6}$ *(combined)* (3)

> $12 \div 4 = 3$, $a^{5-2} = a^3$, $b^{2-6} = b^{-4} \rightarrow \frac{\mathbf{3a^3}}{\mathbf{b^4}}$ ✓✓✓ (3)

13 Write $3\ 200\ 000$ in scientific notation (2)

> $\mathbf{3{,}2 \times 10^6}$ ✓✓ (2)

14 Write $0{,}0007$ in scientific notation (2)

> Small number → negative power → $\mathbf{7 \times 10^{-4}}$ ✓✓ (2)

TOTAL: 24 marks

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