Name: _____ Date: _____

Powers & Exponents Practice Worksheet

Part 1: Write in Exponential Form

Rewrite each repeated multiplication using a base and an exponent.

> **Example:** $5 \times 5 \times 5 = \mathbf{5^3}$ *(The base 5 is multiplied by itself 3 times)*

1. $6 \times 6 \times 6 \times 6 =$ _____

2. $9 \times 9 \times 9 =$ _____

3. $(-4) \times (-4) \times (-4) \times (-4) \times (-4) =$ _____

4. $x \times x \times x \times x \times x \times x =$ _____

5. $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 =$ _____

6. $(-3) \times (-3) \times (-3) =$ _____

Part 2: Evaluate Each Power

Find the numerical value of each expression.

> **Example:** $4^3 = 4 \times 4 \times 4 = \mathbf{64}$ *(Remember: any non-zero number to the 0 power equals 1)*

7. $2^5 =$ _____

8. $7^2 =$ _____

9. $10^4 =$ _____

10. $3^3 =$ _____

11. $8^0 =$ _____

12. $5^3 =$ _____

Part 3: Simplify Using Exponent Rules

Write each expression as a single power using positive exponents.

> **Example:** $3^2 \times 3^5 = 3^{2+5} = \mathbf{3^7}$ | $(2^3)^4 = 2^{3\times4} = \mathbf{2^{12}}$

13. $5^2 \times 5^4 =$ _____

14. $6^7 \div 6^3 =$ _____

15. $(4^2)^3 =$ _____

16. $2^{-3} =$ _____

17. $7^4 \times 7^3 =$ _____

18. $9^8 \div 9^5 =$ _____

Part 4: Combining Rules & Variables

Simplify each expression completely.

> **Example:** $(3x^2)^2 = 3^2 \times x^{2\times2} = \mathbf{9x^4}$ | $2a^3 \times 5a^4 = (2\times5)a^{3+4} = \mathbf{10a^7}$

19. $(2x^3)^2 =$ _____

20. $3a^2 \times 4a^5 =$ _____

21. $10y^6 \div 2y^2 =$ _____

22. $(x^2)^3 \times x^4 =$ _____

23. $5^2 + 3^3 =$ _____

24. $15m^7 \div 3m^4 =$ _____

LIVEWORKSHEETS