

Exponents Worksheet

Name: _____ Date: _____

Part 1: Basic Exponents

1. Write the following in exponential form:

- a) $3 \times 3 \times 3 \times 3 =$ _____
- b) $7 \times 7 =$ _____
- c) $2 \times 2 \times 2 \times 2 \times 2 \times 2 =$ _____
- d) $5 \times 5 \times 5 =$ _____

2. Evaluate the following:

- a) $2^3 =$ _____
- b) $4^2 =$ _____
- c) $10^1 =$ _____
- d) $3^4 =$ _____
- e) $1^8 =$ _____
- f) $6^2 =$ _____

Part 2: Multiplication of Exponents (Same Base)

1. Simplify the following using the rule $a^m \times a^n = a^{m+n}$:

- a) $2^2 \times 2^3 =$ _____
- b) $5^1 \times 5^4 =$ _____
- c) $x^3 \times x^5 =$ _____
- d) $a^2 \times a^7 =$ _____

2. Evaluate after simplifying:

- a) $3^2 \times 3^1 =$ _____
- b) $2^4 \times 2^2 =$ _____

Part 3: Division of Exponents (Same Base)

1. Simplify the following using the rule $a^m \div a^n = a^{m-n}$:

- a) $5^5 \div 5^2 =$ _____
- b) $7^6 \div 7^3 =$ _____
- c) $x^8 \div x^4 =$ _____
- d) $a^9 \div a^6 =$ _____

2. Evaluate after simplifying:

- a) $2^5 \div 2^3 =$ _____

○ b) $3^4 \div 3^2 =$ _____

Part 4: Power of a Power

1. Simplify the following using the rule $(a^m)^n = a^{m \times n}$:

○ a) $(2^3)^2 =$ _____

○ b) $(5^2)^4 =$ _____

○ c) $(x^4)^3 =$ _____

○ d) $(a^5)^2 =$ _____

2. Evaluate after simplifying:

○ a) $(3^2)^2 =$ _____

○ b) $(2^3)^3 =$ _____

Part 5: Zero and Negative Exponents

1. Evaluate:

○ a) $6^0 =$ _____

○ b) $12^0 =$ _____

○ c) $x^0 =$ _____ (where $x \neq 0$)

○ d) $5^{-1} =$ _____

○ e) $2^{-3} =$ _____

○ f) $10^{-2} =$ _____

2. Simplify and then evaluate if possible.

○ a) $4^3 \times 4^{-1} =$ _____

○ b) $3^{-2} \times 3^4 =$ _____

Answer Key:

Part 1: Basic Exponents

○ a) 3^4

○ b) 7^2

○ c) 2^8

○ d) 5^3

○ a) 8

○ b) 16

○ c) 10

○ d) 81

○ e) 1

○ f) 36

Part 2: Multiplication of Exponents (Same Base)

- ☐ a) 2^5
- ☐ b) 5^5
- ☐ c) x^8
- ☐ d) a^9
- ☐ a) 27
- ☐ b) 64

Part 3: Division of Exponents (Same Base)

- ☐ a) 5^3
- ☐ b) 7^3
- ☐ c) x^4
- ☐ d) a^3
- ☐ a) 4
- ☐ b) 9

Part 4: Power of a Power

- ☐ a) 2^6
- ☐ b) 5^8
- ☐ c) x^{12}
- ☐ d) a^{10}
- ☐ a) 81
- ☐ b) 512

MATHS EXPONENTS

Part 5: Zero and Negative Exponents

- ☐ a) 1
- ☐ b) 1
- ☐ c) 1
- ☐ d) $1/5$
- ☐ e) $1/8$
- ☐ f) $1/100$
- ☐ a) $4^2 = 16$
- ☐ b) $3^2 = 9$