

Introduction to Indices

Lesson 18 Worksheet

Name _____

Date _____

Class _____

Section 1 — Skill Practice

Q1. Write each expression in expanded form and evaluate.

(a) 2^3 (b) 5^2 (c) 10^4 (d) 3^4 (e) 1^6

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Q2. Write each expression using index notation.

(a) $2 \times 2 \times 2 \times 2$ (b) 7×7 (c) $10 \times 10 \times 10$
(d) $4 \times 4 \times 4 \times 4 \times 4$ (e) $a \times a \times a \times a$

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Q3. Identify the base and index in each expression.

(a) 6^3 (b) x^5 (c) 10^n (d) $(2a)^4$

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Q4. Calculate:

(a) 2^0 (b) 5^0 (c) 100^0 (d) $(-3)^2$ (e) $(-2)^3$

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Section 2 — Problem Solving

Q5. A bacteria culture doubles every hour. Starting with 100 bacteria:

- (a) How many bacteria after 1 hour? **1 mark**
(b) How many after 4 hours? Write your answer using index notation. **1 mark**
(c) How many after n hours? **1 mark**
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Q6. A square has side length 3 cm. A larger square has side length 3^2 cm.

- (a) Find the area of each square. **1 mark**

(b) How many times larger is the area of the larger square? **1 mark**

(c) If a square has side length 3^3 cm, what is its area? **1 mark**

Q7. Without calculating, determine which is larger: 2^{10} or 10^2 ? Explain your reasoning. **2 marks**

Section 3 — Extended Response

Q8. Investigate the pattern when powers of 2 are multiplied.

(a) Calculate $2^2 \times 2^3$. Write your answer as a single power of 2. **1 mark**

(b) Calculate $2^4 \times 2^5$. Write your answer as a single power of 2. **1 mark**

(c) Predict the result of $2^a \times 2^b$ without calculating. **1 mark**

(d) Test your prediction with $3^2 \times 3^4$. **1 mark**

► Answer Key