Year 7 index laws worksheet

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Name: _____ Date: _____

Question 1

Evaluate 4^3.

Answer: _____

Question 2

Evaluate $2^4 \times 3^2$.

Answer: _____

Question 3

Find the value of n if $3^n = 243$.

Answer: _____

Question 4

Evaluate $10^4 - 9^2$.

Answer: _____

Question 5

Write each product using index notation.

(a) $5 \times 5 \times 5$

(b) $2 \times 2 \times 2 \times 2 \times 2 \times 2$

(c) $7 \times 7 \times 3 \times 3 \times 3$

Answer: _____

Question 6

Evaluate:

(a) 2^5

(b) 3^4

(c) 10^3

Answer: _____

Question 7

Write each number as a power of 10.

(a) 1000

(b) 1 000 000

(c) $10 \times 10 \times 10 \times 10 \times 10$

Answer: _____

Question 8

Evaluate:

(a) $2^3 \times 5^2$

(b) $3^2 \times 2^4$

Answer: _____

Question 9

Which is larger, 2^5 or 5^2, and by how much?

Answer: _____

Question 10

(a) Show that 2^6, 4^3 and 8^2 all have the same value.

(b) Write 729 as a power of 3, as a power of 9 and as a power of 27.

(c) Write 2700 as a product of powers of primes.

Answer: _____

Year 7 index laws: answers and worked solutions

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Question 1

Key idea: 4^3 means $4 \times 4 \times 4$.

1. $4 \times 4 = 16$ 2. $16 \times 4 = 64$

Answer: 64

Question 2

Key idea: Evaluate each power first, then multiply.

1. $2^4 = 16$ and $3^2 = 9$ 2. $16 \times 9 = 144$

Answer: 144

Question 3

Key idea: Keep multiplying by 3 and count the factors.

1. 3, 9, 27, 81, 243 2. That is five factors of 3, so $n = 5$.

Answer: $n = 5$

Question 4

Key idea: Evaluate the powers before subtracting.

1. $10^4 = 10{,}000$ and $9^2 = 81$ 2. $10{,}000 - 81 = 9919$

Answer: 9919

Question 5

Answer: (a) 5^3 (b) 2^6 (c) $7^2 \times 3^3$

Question 6

Answer: (a) 32 (b) 81 (c) 1000

Question 7

Answer: (a) 10^3 (b) 10^6 (c) 10^5

Question 8

Answer: (a) 200 (b) 144

Question 9

Answer: 2^5 is larger by 7 (32 - 25)

Question 10

Answer: (a) $2^6 = 64$, $4^3 = 64$, $8^2 = 64$ (b) 3^6, 9^3, 27^2 (c) $2^2 \times 3^3 \times 5^2$