Name _____ Date _____ Class _____

SKILL 4: Exponents

In 5^4, the 4 is the **exponent**. It tells that 5 is to be used as a factor 4 times.

5^4
base exponent

5^4 is read "5 to the fourth power."
4^2 is read "4 to the second power."

To compare numbers in exponential form, first find the standard form. Then compare.

$$5^4 = \underbrace{5 \times 5 \times 5 \times 5}_{\text{expanded form}} = 625$$

exponential form — standard form

Example

Compare: $5^3 \bigcirc 3^5$.

We know that $5^3 = 5 \times 5 \times 5$, and $3^5 = 3 \times 3 \times 3 \times 3 \times 3$.

$5 \times 5 \times 5 \bigcirc 3 \times 3 \times 3 \times 3 \times 3$

Write in standard form and compare. $125 < 243$

So, $5^3 < 3^5$.

Guided Practice

1. Write $7 \times 7 \times 7 \times 7 \times 7 \times 7$ in exponential form.

a. What will the exponent be? ____ **b.** So, $7 \times 7 \times 7 \times 7 \times 7 \times 7 =$ ____.

2. Write 2^5 in standard form.

a. Write 2^5 in expanded form. _____

b. Multiply the factors in your answer above. ____

3. Compare: $3^4 \bigcirc 3 + 3 + 3 + 3$. Use $<$, $>$, or $=$.

a. Write 3^4 in expanded form. _____

b. Multiply the factors in the expanded form of 3^4. ____

c. Find the value of $3 + 3 + 3 + 3$. ____

d. Compare: $3^4 \bigcirc 3 + 3 + 3 + 3$.

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SKILL 4: Practice

Write in exponential form.

1. $3 \times 3 \times 3 \times 3 \times 3 \times 3$ _____
2. 53×53 _____
3. $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$ _____
4. $13 \times 13 \times 13$ _____
5. $8 \times 8 \times 8 \times 8$ _____
6. 17×17 _____

Write in expanded form.

7. 10^4 _____
8. 6^5 _____
9. 3^2 _____
10. 7^3 _____
11. 12^4 _____
12. 5^6 _____

Write in standard form.

13. 5^4 _____
14. 2^6 _____
15. 10^7 _____
16. 11^2 _____
17. 12^2 _____
18. 6^3 _____

Compare using <, >, or =.

19. 7^3 ◯ $7 + 7 + 7$
20. 3^4 ◯ 4^3
21. 4×10 ◯ 10^4

Solve.

22. The highest point in Kentucky is Black Mountain. Its height is about 2^{12} feet. About how high is Black Mountain? _____

23. Celeste had 3¢ on Day 1. She had three times that much on Day 2. On Day 3 she had three times as much as she had on Day 2. If she continues this pattern, on what day will she have 2,187¢? _____

TEST PREP

24. Which is 4^3 in standard form? *Skill 4*

A 12 C 64
B 7 D 4

25. Which shows a prime factorization? *Skill 3*

F $2 \times 2 \times 3 \times 5$ H $3 \times 4 \times 5$
G $2 \times 3 \times 5 \times 6$ J 9×12