POWER RULE EXTRA PRACTICE

Simplify: $(3^2 \cdot 4^2)^5$

Show your work.

$\frac{45^{-3}}{45^3}$?

Which expression is equivalent to $\frac{(7^2)^5}{7^{-6}}$?

A 7

B 7^4

C 7^{13}

D 7^{16}

Simplify: $(7^5)^6$. Write your answer using an exponent.

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Is the statement $(10^5)(4^5) = 14^5$ true? Explain your reasoning.

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What is the value of x in the equation $(5^x)^5 = 5^{35}$? Explain.

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Complete the table.

Expression	$10^4 \cdot 10^{-2}$	$5^4 \cdot 7^4$	$(2^7 \cdot 4^7)^3$
Simplified Expression			

1. Which shows 5^4 in standard form?

A. 20
B. 625
C. 1,024
D. 3,125

2. Which is $6^3 \times 6^4$ in exponential form?

A. 36^{12}
B. 7^6
C. 6^{12}
D. 6^7

Which shows $4^6 \div 4^5$ in standard form?

A. 0
B. 1
C. 4
D. 16

Which shows $2^{-2} \times 2^6$ in exponential form?

A. 2^4
B. 2^{-4}
C. 2^{-8}
D. 2^{-12}

Which shows $6^{-1} \div 6^{-4}$ in exponential form?

A. 6^{-5}
B. 6^{-3}
C. 6^1
D. 6^3

Look at the expression below.

W $a^6 \div a^4$

A **A.** Simplify the expression. Show your work.

B. 11^{--}
C. 11^8
D. 11^4

Which expression is equivalent to $8^4 \times 8^7$?

A. $(8^4)^7$
B. $8^{19} \div 8^8$
C. 64^{11}
D. 64^{28}

What is the value of the expression $(12^7)^2 \times 12^0$?

A. 0
B. 12^9
C. 12^{14}
D. 144^{14}

Which expression is equivalent to $5^4 \div 5^2$?

A. $\frac{1}{(5 \times 5)}$
B. $\frac{(5 \times 4)}{(5 \times 2)}$
C. $\frac{(4 \times 4 \times 4 \times 4 \times 4)}{(2 \times 2 \times 2 \times 2 \times 2)}$
D. 5×5

Which expression is equivalent to $(3g)^4$?

A. $3g^4$

B. $3^4 \times g^4$

C. $3^4 + g^4$

D. $12g^4$

Which expression is equivalent to $9^{-3} \times 9^{-5}$?

A. $(-1)(9^3 \times 9^5)$

B. $9^3 \div 9^{-5}$

C. $(9^{-5})^3$

D. $9^{-5} \div 9^3$

Robert says that $11^3 \div 11^3$ is equal to 1.

Jasmine says that $11^{-3} \div 11^3$ is equal to 1.

A. Explain who is correct. Use the properties of powers to support your explanation.

B. Simplify the expression that is **not** equal to 1. Use the properties of powers to explain how you simplified the expression. The expression can be written in exponential form.

C. Given the expression $\left(\frac{11}{a}\right)^3$, what number can you substitute for a so that the value of the expression is 1? Explain your answer using the properties of powers.

Circle the expression that makes each equation true.

$5^4 \times$ [5^1 / 5^2 / 5^3 / 5^4] $= 5^8$

$5^6 \div 5^3 =$ [5^1 / 5^2 / 5^3 / 5^4]

Select True or False for each equation.

A. $4^2 \div 4^1 = 4^2$ ○ True ○ False

B. $(3^2)^5 = 3^{10}$ ○ True ○ False

C. $7^2 \times 7^3 = 7^5$ ○ True ○ False

Circle every expression that is equivalent to 7^8.

A. $7^2 \times 7^4$

B. $7^4 \times 7^4$

C. $7^8 \div 7^1$

D. $(7^2)^4$

E. $(7^4)^4$

Simplify the expression. Write your answer as a power.

1. $\dfrac{12^{20}}{12^{9}}$

2. $\dfrac{7.6^{13}}{7.6^{3}}$

3. $\dfrac{(-9)^{15}}{(-9)^{3}}$

4. $\dfrac{(-8.5)^{11}}{(-8.5)^{10}}$

5. $\dfrac{u^{33}}{u^{11}}$

6. $\dfrac{\pi^{9}}{\pi^{4}}$

7. $\dfrac{(-1000)^{13}}{(-1000)^{8}}$

8. $\dfrac{t^{21}}{t^{19}}$

9. One kilometer equals 10^3 meters. One terameter equals 10^{12} meters. How many times larger is a terameter than a kilometer?

Simplify the expression. Write your answer as a power.

10. $\dfrac{11^{7} \bullet 11^{10}}{11^{4} \bullet 11^{2}}$

11. $\dfrac{2.5^{8} \bullet 2.5^{3}}{2.5 \bullet 2.5^{4}}$

12. $\dfrac{(-7.9)^{15} \bullet (-7.9)^{9}}{(-7.9)^{12} \bullet (-7.9)^{7}}$

13. $\dfrac{b^{35}}{b^{20}} \bullet \dfrac{b^{15}}{b^{10}}$

Simplify the expression.

14. $\dfrac{4^{8} \bullet m^{7} \bullet n^{4}}{4^{5} \bullet m^{2}}$

15. $\dfrac{r^{12} \bullet s^{7} \bullet t^{9}}{r^{9} \bullet s^{3}}$

16. $\dfrac{p^{18}q^{11}}{p^{10}q^{8}}$

17. $\dfrac{3^{5}a^{17}b^{21}}{3^{4}a^{15}b^{12}}$

Find the value of *x* in the equation without evaluating the power.

18. $\dfrac{9^{7}}{9^{x}} = 729$

19. $\dfrac{2^{12} \bullet 2^{x}}{2^{10}} = 32$

21.) $(2x)^2$

22.) $(10^2)^3$

23.) $(-3^2 x^6)^5$

24.) $(7j^2)^3$

25.) $(8n^2 p)^3$

26.) $2(3a^2)^3$

27.) $(xy)^2 (x^2 y^2)^2$

28.) $\left(\frac{8x^2}{2x^2}\right)^2$

29.) $\left(\frac{3x}{2y^2}\right)^{2\,5}$

30.) $\left(\frac{3x}{4x^2}\right)^2$