

1.) If two expressions have the same **factor** or **base**, what happens to the exponents when the expressions are **multiplied**?

Simplify each expression. Write answers as a power.

2.) $2^3 \cdot 2^4$

3.) $8^1 \cdot 8^{-3}$

4.) $t^4 \cdot t^4$

5.) $x^5 \cdot x^9$

6.) $x^3 \cdot x^5$

Find the product of the expressions.

7.) $(x^2)(x^2)$

8.) $(x^3y^2)(y^5)$

9.) $(p^{-3})(m^8p^2)$

10.) $(g^{-3}h^8v^6)(gh^8)$

11.) $(f^9h^3)(f^6)(h^2)$

12.) $(x^3y^4)(x^4y^4)$

13.) What is the fast way to simplify when you raise an exponent to another power (or what can you do instead of expanding)?

Simplify each expression. Write answers as a power.

14.) $(x)^2$

15.) $(10^{-2})^{-3}$

16.) $(x^6)^5$

17.) $(j^2)^3$

18.) $(n^2p)^3$

19.) $(a^{-2})^3$

20.) Explain why you can **subtract** exponents when you are dividing two things with the same base.

Simplify to find the quotients. Write answers as a power.

21.) $\frac{a^8}{a^3}$

22.) $\frac{7^{11}}{7^8}$

23.) $\frac{b^5}{b^4}$

24.) $\frac{x^{10}}{x^4}$

25.) $\frac{g^8 \cdot h^4}{g^3 \cdot h^5}$

26.) $\frac{p^{11}}{p^6}$

$$27.) \frac{c^{-9}}{c^4}$$

$$28.) \frac{x^3 y^8}{y^{-2}}$$

$$29.) \frac{x^{14} y^{11}}{x^2}$$

30.) Anything to the zero power is _____. Show why this happens by solving this problem. $\frac{x^5}{x^5} =$ _____

Rewrite **without negative exponents**.

$$31.) c^3 \cdot d^{-2}$$

$$32.) x^4 x^{-10}$$

$$33.) (2^0 \cdot x^{-3})^4$$

$$34.) \frac{a^{12} b^{-3}}{a^5 b^5}$$

$$35.) \left(\frac{5x^{13} y^5 z^2}{3 \cdot 5^2} \right)^0$$

$$36.) (g^3 \cdot g^{-2})^4$$

$$37.) \left(\frac{c^{-5}}{d^0} \right)^3$$

$$38.) \left(\frac{x^{-8}}{y^{11}} \right)^{-2}$$

$$39.) \frac{(x^3) \cdot (x^4)^2}{x^{11}}$$

Exponent	Result
4^4	
4^3	
4^2	
4^1	
4^0	
4^{-1}	
4^{-2}	

40.) What is the pattern on the **left side** of the table with the exponents?

41.) Complete the table. What is the pattern on the **right side** of the table with the results?