

Name Key Date _____ Class _____

HW

Properties of Exponents

Multiply. Write the product as one power.

Add exponents

1. $2^2 \cdot 2^3$

$2^{2+3} = 2^5$

2. $3^5 \cdot 3^2$

$3^{5+2} = 3^7$

3. $1^3 \cdot 1^5$

$1^{3+5} = 1^8$

4. $5^4 \cdot 5^3$

$5^{4+3} = 5^7$

5. $8^1 \cdot 8^1$

$8^{1+1} = 8^2$

6. $7^4 \cdot 7^5$

$7^{4+5} = 7^9$

7. $12^1 \cdot 12^2$

$12^{1+2} = 12^3$

8. $n^3 \cdot n^8$

$n^{3+8} = n^{11}$

Divide. Write the quotient as one power.

Subtract exponents

9. $\frac{2^5}{2^2}$

$2^{5-2} = 2^3$

10. $\frac{10^4}{10^3}$

$10^{4-3} = 10^1 = 10$

11. $\frac{4^6}{4^3}$

$4^{6-3} = 4^3$

12. $\frac{(-3)^6}{(-3)^4}$

$(-3)^{6-4} = (-3)^2$

13. $\frac{5^8}{5^6}$

$5^{8-6} = 5^2$

14. $\frac{24^9}{24^3}$

$24^{9-3} = 24^6$

15. $\frac{(-6)^8}{(-6)^5}$

$(-6)^{8-5} = (-6)^3$

16. $\frac{b^7}{b^5}$

$b^{7-5} = b^2$

Simplify.

Multiply exponents

17. $(3^2)^4$

$3^{2 \cdot 4} = 3^8$

18. $(6^3)^{-1}$

$6^{3 \cdot (-1)} = 6^{-3} = \frac{1}{6^3} = \frac{1}{216}$

19. $(4^5)^0$

$4^{5 \cdot 0} = 4^0 = 1$

20. $(8^2)^3$

$8^{2 \cdot 3} = 8^6$

21. $(5^{-2})^3$

$5^{(-2) \cdot 3} = 5^{-6} = \frac{1}{5^6} = \frac{1}{15,625}$

22. $(7^0)^4$

$7^{0 \cdot 4} = 7^0 = 1$

23. $(9^4)^{-2}$

$9^{4 \cdot (-2)} = 9^{-8} = \frac{1}{9^8} = \frac{1}{43,046,721}$

24. $(5^5)^2$

$5^{5 \cdot 2} = 5^{10}$

25. The Haywood Paper Company has 5^2 warehouses. Each warehouse holds 5^5 boxes of paper. How many boxes of paper are stored in all the warehouses? Write the answer as one power.

$5^2 \cdot 5^5 = 5^{2+5} = 5^7$

26. Write the expression for 5 used as a factor eight times being divided by 5 used as a factor six times. Simplify the expression as one power.

$\frac{5^8}{5^6} = 5^{8-6} = 5^2$