

Name: _____ Period: _____

Score: _____ / _____
_____ % = _____

HW 4-3: Multiply & Divide Monomials

Simplify using the Laws of Exponents.

1. $(-6)^2 \cdot (-6)^5$
 $(-6)^7$

7. $\frac{3^4 x^4}{3x^2}$ $3^3 x^2$

2. $-4a^5(6a^5)$

8. $\frac{4^5 \cdot 5^3 \cdot 6^2}{4^4 \cdot 5^2 \cdot 6}$

3. $(-7a^4bc^3)(5ab^4c^2)$
 $-35a^5b^5c^5$

9. $\frac{6^3 \cdot 6^6 \cdot 6^4}{6^2 \cdot 6^3 \cdot 6^3}$

4. $\frac{8^{15}}{8^{13}}$

10. $\frac{(-2)^5 \cdot (-3)^4 \cdot (-5)^3}{(-2)^3 \cdot (-3) \cdot (-5)^2}$ $(-2)^2(-3)^3(-5)$

5. $\frac{16t^4}{8t}$ $2t^3$

11. Evaluate the simplified answer in the previous problem using multiplication to get a single number. How can you tell if the answer will be a positive or negative number?
 540
 all of the -'s pair up.
 $(-2)^2(-3)^3(-5)$
 positive · negative · negative

12. The processing speed of a certain computer is 10^{11} instructions per second. Another computer has a processing speed that is 10^3 times as fast. How many instructions per second can the faster computer process?

13. The table shows the seating capacity of two different facilities. About how many times as great is the capacity of Madison Square Garden in New York than a typical movie theater?

3^4 or 81 times as big

Place	Seating Capacity
Movie theater	3^5
Madison Square Garden	3^9

14. Refer to the information in the table.

a. How many times as great is one quadrillion than one million?

b. One quintillion is one trillion times as great as what number?

Power of Ten	U.S. Name
10^3	one thousand
10^6	one million
10^9	one billion
10^{12}	one trillion
10^{15}	one quadrillion
10^{18}	one quintillion

Find each missing exponent.

15. $(6^*)(6^3) = 6^5$

↑
2

18. $\frac{3^*}{3^2} = 3^4$

16. $3x^* \cdot 4x^3 = 12x^{12}$

19. $\frac{5^9}{5^*} = 5^4$

↑
5

17. $p^3 \cdot p^* \cdot p^2 = p^9$

↑
4

20. $2x^* \cdot \frac{3x^2}{x^6} = 6x^3$

21. Write a multiplication expression with a product of 5^{13} .

- Answers may vary!
- Exponents must add to 13

example: $5^{10} \cdot 5^3 = 5^{13}$

22. Is $\frac{3^{100}}{3^{99}}$ greater than, less than, or equal to 3? Explain your reasoning.

23. What is twice 2^{30} ? Write using exponents. Explain your reasoning.

$2 \cdot 2^{30} = 2^{31}$ It is twice because twice means \cdot by 2.

24. Which expression is equivalent to $8x^2y \cdot 8yz^2$?

- (A) $64x^2y^2z^2$
(B) $64x^2yz^2$

- (C) $16x^2y^2z^2$
(D) $384x^2y^2z^2$

Simplify using the Laws of Exponents.

25. $(3x^8)(5x)$

$15x^9$

26. $\frac{h^7}{h^6}$

27. $2g^2 \cdot 7g^6$

$14g^8$

28. $(8w^4)(-w^7)$

29. $(-p)(-9p^2)$

$9p^3$

35. One meter is 10^3 times longer than one millimeter. One kilometer is 10^6 times longer than one millimeter. How many times longer is one kilometer than one meter?

(A) 10^9

(B) 10^3

(C) 10^6

(D) 10

Which of the following is equivalent

to $\left(-\frac{2}{3}\right)^3$?

(F) $-\frac{6}{9}$

(G) $\frac{8}{27}$

36.

(H) $-\frac{8}{27}$

(I) $\frac{6}{9}$

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

31. $\frac{36d^{10}}{6d^5}$ $6d^5$

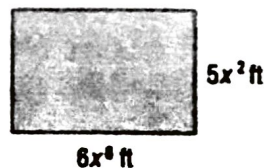
32. $\frac{5^3 \cdot 7^4 \cdot 10}{5 \cdot 7^4}$

33. $\frac{(-3)^2 \cdot 4^3 \cdot (-1)^8}{4 \cdot (-1)^5} = (-3)^2 \cdot 4^2 \cdot (-1)^3$

-144

34. Will the answer in the previous problem be a positive or a negative number when evaluated? Explain

37. Short Response What is the area of the rectangle below?



$30x^{10} \text{ ft}^2$