

EXPONENT WORKSHEET

Exponent Operations #1

Multiplication

Part 1: Expand each expression then evaluate

1.) $2^8 =$ _____ $=$ _____

2.) $5^3 =$

3.) $x^5 =$

4.) $10^3 =$

5.) $8^1 \cdot 8^4 =$

6.) $7^2 \cdot 7^3 = 7^{2+3} = 7^5$

7.) $x^5 \cdot x^4 =$

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

Example: $(7x^2)(2x^3)$

Part 2: Simplify each expression.

9.) $2^3 \cdot 2^4 = 2^7 = 128$ ↖ evaluated

10.) $8^1 \cdot 8^3$

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

12.) $x^5 \cdot x^9$
 x^{14} ↘ Exponent Form

13.) $3^4 \cdot x^3 \cdot x^5$

Part 3: Find the product of the expressions.

14.) $(6x^2)(4x^2) = 24x^4$

15.) $(3x^3y^2)(-6y^5)$

16.) $(5p^3)(-m^8p^2)$

17.) $(10g^3h^8v^6)(11gh^8) = 110g^4h^{16}v^6$

18.) $(4f^9h^3)(-5f^6)(-3h^2)$

19.) $(-2^2x^3y^4)((-3)^2x^4y^4)$

20.) *Challenge: $(3x^a y^b z^c)(-y^f z^g)$

base $\rightarrow X^Q$ ← exponent $(X^2)^3$

Exponent Operations #2

Power to a Power

Part 1: Expand each expression and write the product.

1.) $(2^3)^4 = \underline{2^3 \cdot 2^3 \cdot 2^3 \cdot 2^3} = \underline{2^{3+3+3+3}} = 2^{12}$

2.) $(p^2)^5 = p^{2 \cdot 5} = p^{10}$

3.) $(x^m)^2 = x^{2m}$

4.) $(2^3x)^2 = (2^3)^2 \cdot x^2 = 2^6 \cdot x^2 = \boxed{64x^2}$

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

Multiply exponents

Part 2: Find the product. Expand if it helps you.

6.) $(2x)^2 = 4x^2$

7.) $(10^2)^3 = 10^6 = 1,000,000$
 Exponent Form Evaluated

8.) $(-3^2x^6)^5$

9.) $(7j^2)^3 = 343j^6$

10.) $(8n^2p)^3 = 512n^6p^3$

11.) $2(3a^2)^3$

12.) $(xy)^2(x^2y^2)^2 = (y^2)^4 = y^2 \cdot y^2 = y^{2+2} = y^4$ $2 \cdot 27 \cdot a^6 = 54a^6$

$x^2 \cdot y^2 \cdot x^4 \cdot y^4$

$x^6 y^6$

PART 3- EXTRA PRACTICE

Finish this all for
Hw

SIMPLIFY EACH EXPRESSION:

31) $(x^2)^3 =$

32) $(a^7)^5 =$

33) $(y^{13})^4 =$

34) $(w^{-21})^{-15} =$

35) $(5^2)^3 =$

36) $(23^7)^8 =$

37) $(-y^5)^4 =$

38) $(4y^3)^2 =$

$(-1 \cdot y^5)^4$
 $1 \cdot y^{20}$
 y^{20}

39) $(8c^5)^2 =$

40) $(-3h^9)^3 =$

41) $(y^4d^6)^8 =$

41) $(-c^5h^6)^4 =$

42) $(-15h^9k^7)^3 =$

43) $(k^9)^5(k^3)^2 =$

44) $(3y^6)^2(x^5y^2z) =$

45) $(4h^3)^2(-2g^3h)^3 =$

46) $(14a^4b^6)^2(a^6c^3)^7 =$

SIMPLIFY EACH PRODUCT:

1) $10^{12} \cdot 10^{35} =$

2) $a^7 \cdot a^{12} =$

3) $c^3 \cdot c^8 =$

4) $d^7 \cdot d^9 =$

5) $x^{2e} \cdot x^{8e} =$

6) $w^{103} \cdot w^{1030} =$

7) $a^6 \cdot b^5 =$

8) $10^a \cdot 10^b =$

9) $g^{12} \cdot g^{19} \cdot g^{11} =$

10) $2x^4 \cdot x \cdot 3x^4$

11) $x^3 \cdot x^8 \cdot x$

12) $7x^3 \cdot 3x^5$

13) $(-3x^7) \cdot (-3x^5)$

14) $5^2 \cdot 7^6 \cdot 7^7 \cdot 5^4$

15) $(2a)(-3a)(5a)$

16) $n^2 \cdot n^7$

17) $s \cdot s^3 \cdot s^2$

18) $4 \cdot 5 \cdot 4$

19) $2ab^3 \cdot a^6$

20) $2x^3 \cdot x^6 \cdot 3x$

21) $x^7 \cdot x^8$

SIMPLIFY EACH PRODUCT:

22) $(2x^2)(4x^3y^2) =$

23) $(-3a^2b)(6ab^4c) =$

24) $(7q^5)(12q^3r^5) =$

25) $(11c^8)(-10c^4d) =$

26) $(9x^{10}z^2)(-x^5y^3) =$

27) $(-8f^6g)(-7f^2g^5h) =$

28) $(1.3a^6b^{11}c^5)(0.5a^2bc^3) =$

29) $(-2x^2z)(-4y^2z)(-3xyz) =$

30) $(a^xb^yc^z)(a^rb^sc^t) =$