

HOMEWORK

Numbers, Relations & Functions 10 Name _____


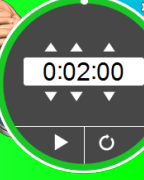
Multiplying Polynomials Date _____

Find each product.

1) $5(6b + 3)$ $30b + 15$	2) $8(6r + 3)$ $48r + 24$
3) $2(8x + y)$ $16x + 2y$	4) $5mn(3m + 2n)$ $15m^2n + 10mn^2$
5) $7(x - 7y)$ $7x - 49y$	6) $2mn(8m - 2n)$ $16m^2n - 4mn^2$
7) $(4x - 2y)(6x + 6y)$ $24x^2 + 12xy - 12y^2$	8) $(6x + 3y)(4x - 7y)$ $24x^2 - 30xy - 21y^2$
9) $(2x + 5y)(7x - 8y)$ $14x^2 + 19xy - 40y^2$	10) $(3x + 6y)(5x - 8y)$ $15x^2 + 6xy - 48y^2$
11) $(5x - 4y)(5x^2 - 4xy + 6y^2)$	12) $(8x - 7y)(6x^2 + 8xy + 3y^2)$
13) $(6a^2 - 2a - 3)(8a + 2)$	14) $(2k^2 + 8k - 2)(7k + 4)$
15) $(7a^2 - 2ab + 2b^2)(a^2 - 2ab - 8b^2)$	16) $(x^2 - 4xy + 2y^2)(x^2 - 2xy - 7y^2)$

Oct 11-8:52 PM

Warm Up

Expand and Simplify

$$(x-3)^2 - (x+2)^2$$

$$(\overset{\text{red}}{x-3})(\overset{\text{red}}{x-3}) - (\overset{\text{blue}}{x+2})(\overset{\text{blue}}{x+2})$$

$$\overset{\text{red}}{x^2 - 3x - 3x + 9} - \overset{\text{blue}}{(x^2 + 2x + 2x + 4)}$$

$$\overset{\text{red}}{(x^2 - 6x + 9)} - \overset{\text{blue}}{(x^2 + 4x + 4)}$$

$$\overset{\text{red}}{x^2 - 6x + 9} - \overset{\text{blue}}{x^2 + 4x + 4}$$

$$\overset{\text{red}}{x^2 - x^2} - \overset{\text{purple}}{6x + 4x} + \overset{\text{purple}}{9 - 4}$$

$-10x + 5$

Nov 24-8:13 AM



Warm Up

$$1) [(-2)^3 \times (-2)^2] - [(-3)^3 \div (-3)^2]$$

$$2) \frac{[(2 \times 2^2)^5 - (5^6 \div 5^4)^4]^0}{(3^3 \times 3)^2 - (3^6 \div 3^4)^2}$$

3)

Simplify the following using laws of exponents

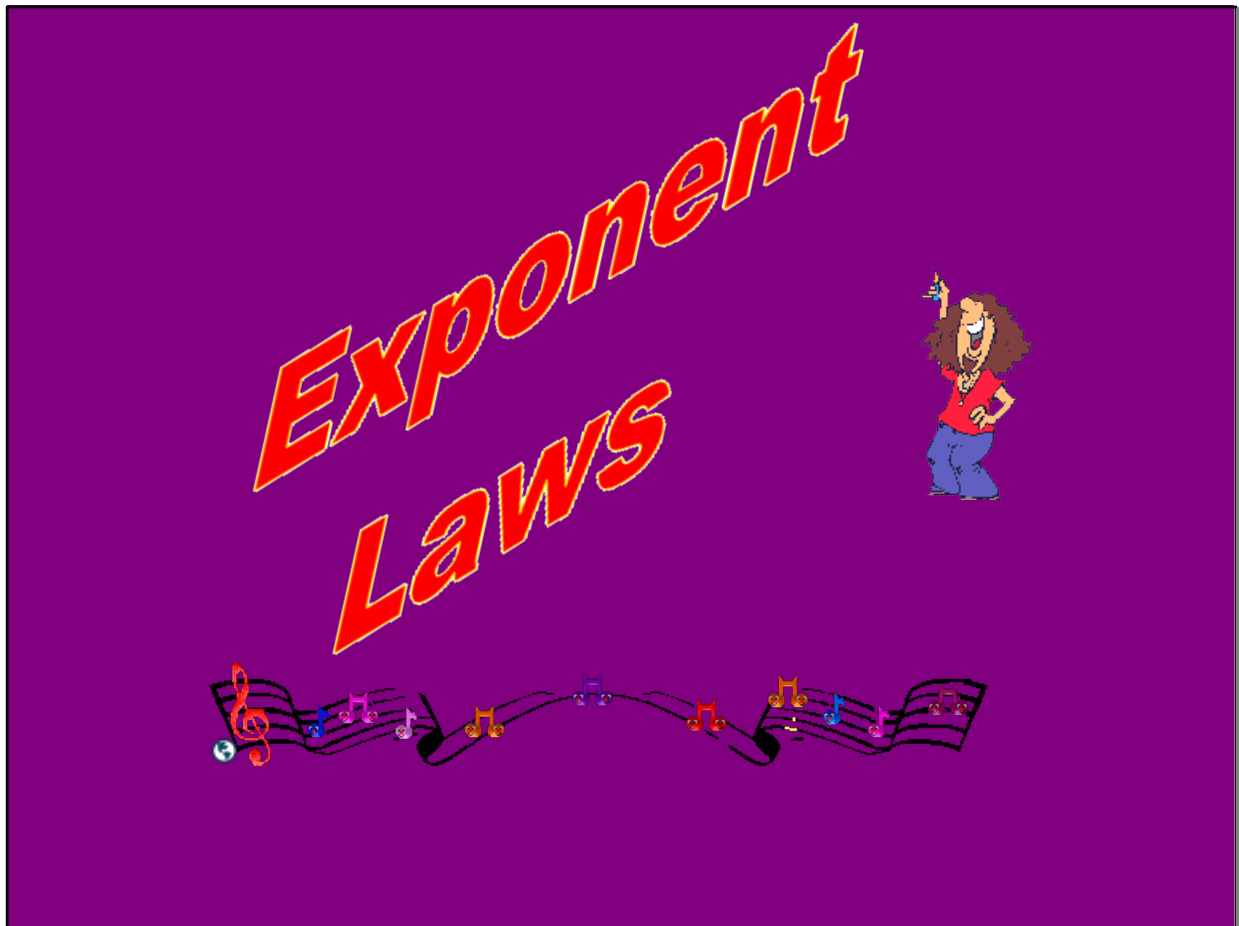
a) $(3xy^2)^4$

b) $\frac{(12r^{12}t^3)}{(3r^{10}t^2)}$

Sep 7-8:02 PM



Nov 6



Nov 14-6:21 PM

Laws Of Exponents



Law #1: Product Rule

$$b^m \times b^n = b^{m+n}$$

- when multiplying powers with the same base you add the exponents



Exercise:

Simplify the following using the laws of exponents

a) $3^2 \times 3^4$

b) $4^3 \times 3^4$

c) $(q^7)(q)$

d) $p \times p^3 \times p^2$

e) $(2x^3)(4x^2)$

f) $(3z^3)(6z^{12})$

Nov 6

Law #2: Quotient Rule

$$b^m \div b^n = b^{m-n}$$

- when dividing powers with the same base you subtract the exponents

Exercise:

Simplify the following using exponent laws

a) $5^{23} \div 5^{12}$

b) $\frac{x^{34}}{x^{19}}$

c) $c^3 \div c^2$

d) $\frac{12x^3}{4x}$

e) $\frac{25c^{30}}{5c^{23}}$

Nov 6

Law #3: Power Rule

when raising a power to another power...MULTIPLY the exponents."

$$(b^m)^n = b^{mn}$$

Law #4: Power of Product

when a product is raised to a power, each of the factors are raised to the power."

$$(ab)^m = a^m b^m$$

- when brackets are involved you must multiply the exponents

Exercise:

Simplify the following using Laws of Exponents

a) $(m^3)^4$

b) $(x^2y^4)^3$

c) $(2d^3)^3$

d) $(2m^4n)^2(m^3n^2)$

Nov 6

Law #5: Power of Quotient Rule

when a quotient is raised to a power, both the divisor and the dividend are raised to the power."

$$\left(\frac{a}{b}\right)^n = \left(\frac{a^n}{b^n}\right)$$

Law #6: Zero Rule

$$b^0 = 1$$

- any power raised to the exponent 0 (zero) is equal to 1

Nov 6

Law #7: Negative Reciprocals

$$b^{-m} = \frac{1}{b^m}$$

Examples:



$$\frac{1}{b^{-3}} = b^3$$

$$x^2 y^{-3} = \frac{x^2}{y^3}$$

$$x^{-4} y^5 = \frac{y^5}{x^4}$$

$$\frac{x^{-3}}{y^{-4}} = \frac{y^4}{x^3}$$

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$$\begin{aligned}
 & [2^1 x^2 y^{-2}]^{-3} \\
 & 2^{-3} x^{-6} y^6 \\
 & = \frac{y^6}{2^3 x^6} \\
 & = \frac{y^6}{8 x^6}
 \end{aligned}$$

Jan 11-10:00 AM

$$\begin{aligned}
 & \left[\frac{5 x^3 y^5}{3 x^6 y^2} \right]^{-2} = \left[\frac{5 x^{-3} y^3}{3} \right]^{-2} \\
 & = \frac{5^{-2} x^6 y^{-6}}{3^{-2}} \\
 & = \frac{3^2 x^6}{5^2 y^6} \\
 & = \frac{9 x^6}{25 y^6}
 \end{aligned}$$

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$$\left[\frac{2x^3y^6}{3x^2y^3} \right]^{-2} = \left[\frac{2x^3y^6}{3x^2y^3} \right]^{-2}$$

$$= \frac{2^{-2} x^{-2} y^{-6}}{3^{-2}}$$

New

$$= \frac{3^2}{2^2 x^2 y^6}$$

$$= \frac{9}{4 x^2 y^6}$$

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$$\frac{[3x^{-2}y^4]^2}{[2x^3y^{-2}]^3} = \frac{3^2 x^{-4} y^8}{2^3 x^9 y^{-6}}$$

$$= \frac{9 x^{-13} y^{14}}{8}$$

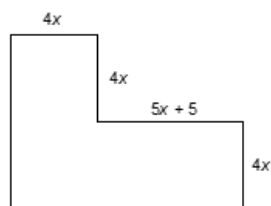
-4-9
8-(-6)

$$= \frac{9 y^{14}}{8 x^{13}}$$

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6. Answer the questions below using the shape to the right:

- a) Determine a polynomial for the area of the shape. SHOW ALL WORK (4)



- c) Determine the area of the shape when $x = 5$ cm. SHOW ALL WORK (2)

Jan 11-9:26 AM

Law #7b: Negative Reciprocal Quotient

$$\left(\frac{a}{b}\right)^{-n} = \left(\frac{b^n}{a^n}\right)$$

Examples:

$$\left(\frac{3}{4}\right)^{-3} =$$

Nov 6

Date _____

Extended Laws of Exponents

Simplify. Your answer should contain only positive exponents.

1) $4a^2 \cdot 5a^2$	2) $3b \cdot 8b^3$
3) $7x^3 \cdot x^2$	4) $5x \cdot 8x^3$
5) $\frac{a^4}{3a^3}$	6) $\frac{5n^2}{8n^4}$
7) $\frac{2n^4}{8n}$	8) $\frac{7r}{6r}$
9) $(8n)^4$	10) $(7k)^3$
11) $(6k)^2$	12) $(5x^2)^4$
13) $4b^{-1} \cdot 2b^{-2}$	14) $4m \cdot 3m^{-4}$
15) $6x^{-3} \cdot 3x^3$	16) $7v \cdot 8v^{-2}$
17) $\frac{6n^3}{2n^3}$	18) $\frac{2x^2}{2x^3}$
19) $\frac{5x^3}{3x^4}$	20) $\frac{5b^{-4}}{4b^{-1}}$

-1-

Jan 1-8:48 PM

21) $(2m^{-2})^4$	22) $(4x^{-2})^{-2}$
23) $(8n^{-4})^4$	24) $(6x^{-4})^3$
25) $\frac{3r^3 \cdot 2r}{(2r)^4}$	26) $\frac{2v^2}{(3vw^3)^3}$
27) $\frac{x^2 \cdot 3x^4}{(2x^{-4})^{-2}}$	28) $\frac{3n^{-4} \cdot 2n^4}{(3n)^4}$
29) $\frac{(2n^{-3})^3 \cdot n^3}{3n^{-3}}$	30) $\left(\frac{2v^2 \cdot 4v^{-2}}{2v^2}\right)^2$
31) $\left(\frac{3p^3 \cdot p^2}{3p^3}\right)^{-2}$	32) $\frac{3a^{-1} \cdot 4a}{a^4}$
33) $\frac{2n^3}{4n^3 \cdot (n^4)^2}$	34) $\frac{p \cdot p^3 \cdot 2p}{(4p^4)^4}$
35) $\frac{(x^2)^3}{x^2 \cdot x^2}$	36) $\frac{(3n^4)^2}{3n^2 \cdot 3n^2}$
37) $\left(\frac{3n^2}{3n^2 \cdot n}\right)^4$	38) $\frac{x^2}{(2x^3 \cdot x^4)^4}$

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Answers to Extended Laws of Exponents (ID: 1)

1) $20a^4$

5) $\frac{a}{3}$

9) $4096n^4$

13) $\frac{8}{b^3}$

17) 3

21) $\frac{16}{m^8}$

25) $96r^8$

29) $\frac{8}{3n^3}$

33) $\frac{1}{2n^8}$

37) $\frac{1}{n^4}$

2) $24b^4$

6) $\frac{5}{8n^2}$

10) $343k^3$

14) $\frac{12}{m^3}$

18) $\frac{1}{x}$

22) $\frac{1}{16x^4}$

26) $\frac{2}{27v^{10}}$

30) $\frac{16}{v^4}$

34) $\frac{1}{128p^{11}}$

38) $\frac{1}{16x^{26}}$

3) $7x^5$

7) $\frac{n^3}{4}$

11) $36k^2$

15) 18

19) $\frac{5}{3x}$

23) $\frac{4096}{n^{16}}$

27) $\frac{12}{x^2}$

31) $\frac{1}{p^4}$

35) x^2

4) $40x^4$

8) $\frac{7}{6}$

12) $625x^8$

16) $56v^3$

20) $\frac{5}{4b^3}$

24) $\frac{216}{x^{12}}$

28) $\frac{2}{27n^4}$

32) $\frac{12}{a^4}$

36) n^4

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