Exponent Laws

 $0 x^a x^b = x^{a+b}$

(2) x2/x6 = x a-6

6 x = 1/x

9 /x-a = xa ((x/4) = 8/2 ((xy)-a= x/ya

 $\begin{array}{ll}
3 & (x^a)^b = x^{ab} \\
4 & x^0 = 4
\end{array}$

 $\frac{\partial}{\partial x^{-1}} = x$ $\frac{\partial}{\partial x} = \frac{1}{2} = x$

(2) $(ax^b)^c = a^c x^{bc}$

 $(3)^{1/2x} (3^{2}y)^{-2(x^{2}y^{2})} = \frac{2}{3} (\frac{8/y^{2}}{4x^{2}}) (\frac{1}{x^{2}y^{4}}) = \frac{27}{2x^{2}y^{2}}$ (1) - (-xy2)3(-3x42)2 - (-345)(9x247) = 9xy2

Rational Exponents

0 x 3/5 = 1/2 x 1/5 = 3/x

 $3 x^{-\alpha/2} = \frac{1}{4|x^{\alpha}|} x^{1/2} = \sqrt{x}$

* When solving, convert all radicals to exponents, simplify, then Convert back.

Examples (a) 3/x 1/x2 = x1/3 x3/5 = x1/15 = 15/x11 6 1 = 2 (((x /2) /2) /2 = 2 /16 = 16 X

Solving Exponential Equations

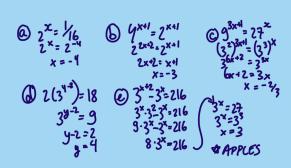
17 The variable is the exponent

1) Get a single term on each side

@ Get the bases the same

3 "Drop the bases" & set the exp. equal

@ Solve



Radicals

Q Jarls = Jab

((ath) (cold) = acold

Q 1/2 = 1/2/13 3) Vava=a

S Ta+√a = 2√a

1) 1213=16

(9 (2V3)(3V2) = 6V6

@ \\g = 3

6) 3V5+2V5=5V5

(3) 1/21/2=2

Simplify 4 pullout largest perf. square

Multiply Add La use laws Glike terms

@ V40 = 2710 @(2.43)(-3.46) 6 -3-150= -1562 0 (2-52)5

Complex Numbers (imaginary)

i = 1 - 1 $i^2 = -1$ Ly treat 'i' like a var Powers of i Express as i2 to x paw If x is even, mult by 1, if odd, mult by -1 Writing Roots in terms of i: V-T=i so, "pullout" an ":"

@ $i^{5}=i(i^{2})^{2}=i(1)=i$

@ i2002 = -1

@ (602=(i2)301=-1 @ V-4 = 2i

6 1-7 = iTF

@ J-8=2112

@ \f-(-1/14)2if-i = -i (-1)i2 =-i

<u>Pationalize Roots & Complex Numbers</u>

17 we remove all radicals from bottoms of fractions by multiplying by 'one'

1 Term when bottom is a binomial, you must conjugate.

(a)
$$\frac{2}{15} \cdot \frac{15}{15} = \frac{2\sqrt{5}}{5}$$

(b) $\frac{2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{15} = \frac{2\sqrt{2}}{2} = \sqrt{2}$

(c) $\frac{2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$

(d) $\frac{2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$

(e) $\frac{2\sqrt{2}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$

(f) $\frac{2\sqrt{2}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$

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Imaginary Nums - $i^2 = -1$ (a) $\frac{5}{2}i^{1}i^{2} = \frac{5i}{-2}i^{2}$ (b) $\frac{4+2i}{3i}i^{2}i^{2} = \frac{4+2i}{-3}i^{2}$ (c) $\frac{2+3i}{1-2}i^{2}i^{2} = \frac{2+4i}{1+7}i^{2}$

Polynomials

Terms - Separated by addition or subtraction

Polynormial - Expression/equation with a single var & pos. Int exponents

Degree - Highest power exponent in a polynomial

Standard Form - Write the terms from highest to lowest power

Leading Coefficient - First coefficient of a polynomial in standard form

Eqn	Poly?	strd? form?	# terms	dag	name (terms)	name (deg)
⊚ 5 _x 4	V	V	1	4	monomial	quartic
$G x^2 - x^3$	X	_	_	_	_	_
C 2 3+2x5+7	V	χ	3	5	trinomial	quintic

Multiplying Polynomials

		EXAMPLES			
Distributive Law	Shortcuts	(a) $(x+3)(x-2) = x^2 + x - 6$			
a(b+c)=ab+ac	$(a+b)^2 = a^2 + 2ab+b^2$	(a ² -2b)(3a ² -b ²)=3a ⁴ -a ² b ² -6a ² b + 2b ³			
a(b+c+ol)=ab+ac+ad	$(a-b)^2 = a^2 - 2ab + b^2$	© $(2x-3)^3 = (2x-3)(2x-3)^2 = (2x-3)(4x^2-12x+9)$			
(a+b)(c+d) = ac+ad+bc+bd	$(a+b)(a-b) = a^2-b^2$	© (2x-3)3=(2x-3)(2x-3)2=(2x-3)(4x2-12x+9) @ (2xy-4xy2)2=4x62-16x43+16x43			