

Lesson 50 Objective: SWBAT simplify expressions using the laws of exponents.

Kickoff- Find the solution to the following.

$4 - 3x = 2 - 7x$  C.D.  $x=0$

$4 - 3x = 2 - 7x$   
 $-2 + 3x = -2 + 3x$   
 $2 = -4x$   
 $-\frac{2}{4} = \frac{-4x}{-4}$   
 $-\frac{1}{2} = x$

$(-\infty, -\frac{1}{2}] \cup (0, \infty)$

$-1 \quad -\frac{1}{2} \quad -\frac{1}{4} \quad 0 \quad 1$

$x \quad y_1 \quad y_2$

-1	-7	-9
-25	-19	-15
1	1	-5

Homework

Laws of Exponents		
Law	Rule	Example:
Law of Products.	add	1) $(x^2)(x^3)$ $x^5$
Law of Quotients	Subtract	2) $\frac{x^5}{x^3}$ $x^2$
Power to a Power	Multiply	3) $(x^2)^3$ $x^6$
Power to a product	Distribute	4) $(xy^2)^3$ $x^3y^6$

Power to a quotient	distribute * num and denom.	5) $(\frac{x^2}{y^3})^4$ $\frac{x^8}{y^{12}}$
Law of zero	ALWAYS 1	6) $x^0$ $1$
Law of negatives	flip	7) $x^{-3} = \frac{1}{x^3}$
		8) $(\frac{x^2}{y})^{-2}$ $\frac{x^{-4}}{y^{-2}} = \frac{y^2}{x^4}$ $(\frac{y}{x^2})^2 = \frac{y^2}{x^4}$

Examples:

1)  $(\frac{2a^4b^8}{5ab})^2$

$\frac{2^2 a^8 b^{16}}{5^2 a^2 b^2}$

2)  $3a^{-2}$

$\frac{3}{a^2}$

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

$\frac{b^{12}}{6^3} = \frac{b^{12}}{216}$

4)  $3(2a^4b)^{-4}$

$\frac{3}{2^4 a^{16} b^4} = \frac{3}{16a^{16}b^4}$

5)  $\left(\frac{3x^{-2}b^3}{2}\right)^{-3}$

$$\frac{2^3 \cdot 3^3 \cdot b^{-9}}{3^3 \cdot 2^3} = \frac{8x^6}{27b^9}$$

6)  $\frac{2^3}{(3a^2b)^{-3}}$

$$2(3a^2b)^3$$

$$2 \cdot 27a^6b^3$$

$$54a^6b^3$$

7)  $\frac{(2a^{-3}b^{-6})^{-3}}{8ab}$

$$\frac{2^{-3} \cdot 3a^{15} b^{24}}{8ab} = \frac{a^{14} b^{23}}{64}$$

8)  $\frac{a^{\frac{1}{2}} b^2 c^{-2}}{4a^{\frac{3}{5}} b^{-\frac{1}{5}}}$

$$1 + (-1/10) = 11/10$$

$$a^{\frac{1}{2}} b^{\frac{11}{10}} c^{-1}$$

$$2a^{1/2} c$$