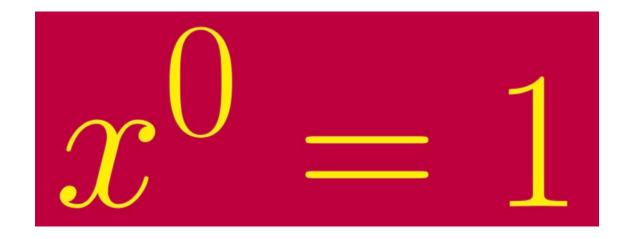
# Laws of Exponents

Lesson 2

## Law 4: Zero Exponent



Click on the link below for a video on the Zero Exponent.

https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-arithmetic-operations/cc-6th-exponents/v/the-zeroth-power

#### Some Practice Problems

• Simplify fully:

$$1.54^{0}$$

$$4. \frac{x^7 y^3}{x^5 y^0}$$

2. 
$$7y^0$$

5. 
$$(17xy^2)(x^0z^3)^4$$

$$3. \left(\frac{134y^2x^3}{49z^5w^{17}}\right)^0$$

6. 
$$\frac{(13x^7y^3)^0(3y^6z^9)}{(6.3x^7z^9)^0(12y^7x^4)}$$

1. 1

$$4. x^2y^3$$

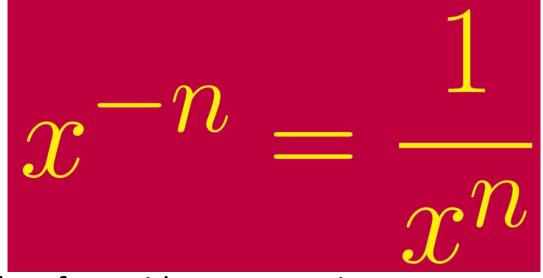
2.7

5. 
$$17xy^2z^{12}$$

3. 1

$$6. \frac{z^9}{4yx^4}$$

## Law 5: Negative Exponents



Click on the link below for a video on negative exponents.

https://www.khanacademy.org/math/pre-algebra/pre-algebra-exponents-radicals/pre-algebra-negative-exponents/v/negative-exponents

#### Some Practice Problems

• Simplify fully (write without negative exponents):

$$1.5^{-3}$$

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

$$2.(-3)^{-4}$$

5. 
$$\left(-\frac{4}{5}\right)^{-2}$$

3. 
$$\left(\frac{1}{2}\right)^{-5}$$

$$6. \frac{7x^{-5}}{5y^{-6}}$$

$$1. \frac{1}{125}$$

$$4. \frac{64}{27}$$

$$2. \frac{1}{81}$$

$$5. \frac{25}{16}$$

6. 
$$\frac{7y^6}{5x^5}$$

## More on Negative Exponents

Click on the link below for a video on intuition for negative exponents.

https://www.khanacademy.org/math/pre-algebra/pre-algebra-exponents-radicals/pre-algebra-negative-exponents/v/negative-exponent-intuition

#### Some More Practice Problems

Simplify fully (write without negative exponents):

1. 
$$7x^{-3}y^4$$

4. 
$$(-2x^{-4}y^3)^{-5}$$

2. 
$$(3x^{-7}y^4)(4x^3y^{-5})$$
 5.  $\frac{5x^{-2}y^8}{(2x^{-3}y^6)^{-2}}$ 

$$5. \frac{5x^{-2}y^8}{(2x^{-3}y^6)^{-2}}$$

$$3. (4x^2y^4)^{-3}$$

$$6. \left( \frac{2x^{-5}y^7z}{-3x^{-4}y^{-2}z^9} \right)^{-3}$$

1. 
$$\frac{7y^4}{x^3}$$

$$4. -\frac{x^{20}}{32y^{15}}$$

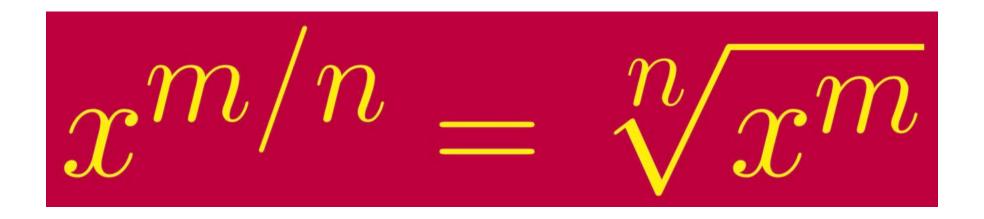
$$2. \frac{12}{x^4y}$$

$$5. \frac{20y^{20}}{x^8}$$

$$3. \frac{1}{64x^6y^{12}}$$

$$6. -\frac{27x^3z^{24}}{8y^{27}}$$

## Law 6: Fractional Exponents



Click on the link below for a video on fractional exponents.

https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:exp/x2ec2f6f830c9fb89:rational-exp/v/basic-fractional-exponents

## More on Fractional Exponents

Click on the link below for more on fractional exponents.

https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:exp/x2ec2f6f830c9fb89:eval-exp-rad/v/fractional-exponents-with-numerators-other-than-1

#### **Practice Problems**

• Simplify fully:

 $1.8^{3/2}$ 

4. 
$$\left(\frac{32x^{10}}{y^{15}}\right)^{2/5}$$

2.  $(27x^6y^9)^{1/3}$ 

$$5. \left(\frac{81x^8}{16y^{-4}}\right)^{-3/4}$$

 $3.25^{-1/2}$ 

6. 
$$(8x^2y)^{2/3}(5x^{2/3}y^{1/3})$$

1.64

2.  $3x^2y^3$ 

 $3. \frac{1}{5}$ 

$$4. \frac{4x^4}{y^6}$$

$$5. \frac{8y^3}{27x^6}$$

6.  $20x^2y$ 

# Summary of Laws of Exponents

1. 
$$x^a x^b = x^{a+b}$$

$$4. x^0 = 1$$

$$2. \frac{x^a}{x^b} = x^{a-b}$$

$$5. x^{-n} = \frac{1}{x^n}$$

3. 
$$(x^a)^b = x^{ab}$$

6. 
$$x^{m/n} = \sqrt[n]{x^m}$$