Do Now

Simplify the expression

$$\frac{18x^3y^8}{6x^3y}$$

$3y^7$

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Homework Answers

1) 6^6
2) x^8
3) $25w^2x^6$
4) $8x^{15}$
5) a^4
6) $9p^4q^6$
7) $8r^9s^6$
8) $96x^{10}y^8$
9) $27y^9z^{12}$
10) $576b^4$

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The Rules of Exponents

Changing Negative Exponents

$$ax^{-b} = \frac{a}{x^b}$$

1) Circle the negative exponent and its base

2) Move all circled items to the denominator [exponents become positive when moved]

3) Leave everything else on the numerator

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Find the value of each expression

1) 3^{-1}

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

2) 7^{-2}

$\frac{1}{7^2} = \frac{1}{49}$

3) $5^0 + 2^{-3}$

$1 + \frac{1}{2^3}$

$1 + \frac{1}{8}$

$1\frac{1}{8} = \frac{9}{8}$

4) $4x^0 + 3^2$

$4 \cdot 1 + 3^2$

$4 + 9$

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Rewrite each expression with positive exponents only

1) $\frac{x^3}{x^5} = x^{-2} = \frac{1}{x^2}$

2) $5n^{-7} = \frac{5}{n^7}$

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

4) $x^{-5} = \frac{1}{x^5}$

5) $3^{-2} = \frac{1}{3^2}$

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Evaluate $7x^0 + 3x^{-2}$ when x = 3.

$7(3)^0 + 3(3)^{-2}$

$7(1) + \frac{3}{3^2}$

$7 + \frac{3}{9}$

$7 + \frac{1}{3}$

$7\frac{1}{3}$ or $\frac{22}{3}$

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Multiplication with Negative Exponents

$3x^{-8}y^{2} \bullet 5x^{3}y^{-3}$

$15x^{-5}y^{-1}$

$\frac{15}{x^{5}y^{1}}$

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Division with Negative Exponents

$$\frac{2x^{-3}}{4x^{5}}$$

$\frac{1}{2}x^{-8}$

$\frac{1}{2} \cdot \frac{1}{x^{8}} = \frac{1}{2x^{8}}$

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Power to a Power with Negative Exponents

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

$(2^{-4}a^{12})(4^{-2}x^{8})$

$\frac{a^{12}x^{8}}{2^{4}\,4^{2}}$

$\frac{a^{12}x^{8}}{16\cdot 16}$

$\frac{a^{12}x^{8}}{256}$

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