

Assume  $a$ ,  $b$ ,  $m$ ,  $n$ ,  $v$ , and  $w$  are positive

Product of a Power $a^n \cdot a^m = a^{n+m}$  Product of Powers $(a^n \cdot b^m)(a^v \cdot b^w) = a^{n+v}b^{m+w}$	Power of a Power $(a^n)^m = a^{mn}$  Power of Powers $(a^n b^v)^m = a^{mn}b^{mv}$	Power of a Quotient $\left(\frac{a^n}{b^v}\right)^m = \frac{a^{mn}}{b^{mv}}$ Quotient of Powers $\frac{a^n}{a^m} = a^{n-m}$
Zero as an Exponent $a^0 = 1$ with $a \neq 0$	Negative Exponent 1 $a^{-n} = \frac{1}{a^n}$ with $a \neq 0$	Negative Exponent 2 $b^m = \frac{1}{b^{-m}}$ with $b \neq 0$

**Clearly show your work and follow specific directions****DO NOT USE ANY DECIMALS WHATSOEVER ON THIS QUIZ**

Express each of the following without decimals or negative exponents in their simplest form

Assume  $x$ ,  $y$ , and  $z$  are NON-ZERO

Problem 1  $(3x^{-6}y)^{-3}$

Problem 2  $\left(\frac{(2x^{-5}y)^{-3}}{4x^2y^{-5}}\right)^2$

Problem 3  $\left(\frac{2}{5}xy^4\right)^{-3} \cdot (4x^{-3}y^2)^2$

Problem 4  $\left(\frac{4x^5y}{8xy^0}\right)^2$



Assume  $a$ ,  $b$ ,  $m$ ,  $n$ ,  $v$ , and  $w$  are positive

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Zero as an Exponent $a^0 = 1$ with $a \neq 0$	Negative Exponent 1 $a^{-n} = \frac{1}{a^n}$ with $a \neq 0$	Negative Exponent 2 $b^m = \frac{1}{b^{-m}}$ with $b \neq 0$

**Clearly show your work and follow specific directions****DO NOT USE ANY DECIMALS WHATSOEVER ON THIS QUIZ**

Express each of the following without decimals or negative exponents in their simplest form

Assume  $x$ ,  $y$ , and  $z$  are NON-ZERO

Problem 1  $(5x^{-7}y)^{-2}$

Problem 2  $\left(\frac{(4x^{-5}y)^{-4}}{2x^3y^{-6}}\right)^3$

Problem 3  $\left(\frac{5}{2}xy^6\right)^{-2} \cdot (10x^{-4}y^3)^2$

Problem 4  $\left(\frac{10xy^5}{5x^0y}\right)^2$

Rewrite in simplest form WITHOUT a fraction

Problem 5  $\left(\frac{4xy^{10}}{y^{11}}\right)^{-2}$

Rewrite WITHOUT NEGATIVE EXPONENTS

Problem 6  $4^{-3}x^2y^{-4}z^6$

Simplify completely and express without decimals or negative exponents ASSUME v and w are positive

Problem 7  $\left(\frac{(6x^{-6}y)^0 \cdot 3x^5}{12x^w y^{-4}}\right)^{-v}$

Extra Credit

1. Name a new year's resolution or goal from the past that you FAILED to accomplish
2. Name a new year's resolution or goal for 2022 that relates to your ACADEMIC life
3. Name a new year's resolution or goal for 2022 that DOES NOT relate to your ACADEMIC life
4. Complete this statement  
By the END 2022.....