Name: _____ Class: M 2/_____ Number:_____

Worksheet 2 Exponents

1. Simplify the following with positive exponents only.

1) $\left[(5a)^{5mn} \div \left(5^{m}\right)^{5n}\left(a^{2m}\right)^{-3n}\right]^{-2}$

$=\left[5^{\square} \cdot a^{\square}\right]^{\square}$ $\qquad = \dfrac{1}{a^{\square}}$

2) $\dfrac{9^{n-1}}{3^{n-1}} \div \dfrac{27^{n+1}}{81^{n-1}}$

$= \dfrac{\square^{\square(n-1)}}{3^{n-1}} \times \dfrac{\square^{\square(n-1)}}{\square^{\square(n+1)}}$ $\qquad = 3^{\square} \times 3^{\square}$ $\qquad = 3^{\square - \square}$

3) $\dfrac{2^{m+3}}{15^{-m-1}} \times \dfrac{6^{-m+2}}{5^{m+1}}$

$= \dfrac{2^{m+3}}{(3\times\square)^{-m-1}} \times \dfrac{(2\times\square)^{-m+2}}{5^{m+1}}$

$= \dfrac{2^{m+3}}{\square^{-m-1}\times\square^{-m-1}} \times \dfrac{\square^{-m+2}\times\square^{-m+2}}{5^{m+1}}$ $\qquad = \dfrac{2^{\square}\times 3^{\square}}{5^{\square}}$ $\qquad = 2^{\square} \times 3^{\square}$

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4) $\dfrac{4^{n+3}}{15^{-n-1}} \times \dfrac{12^{-n+2}}{5^{n+1}} \times \dfrac{1}{24^{3}}$

$= \dfrac{\left(2^{\square}\right)^{n+3}}{\left(\square \times \square\right)^{-n-1}} \times \dfrac{\left(2^{\square} \times \square\right)^{-n+2}}{5^{n+1}} \times \dfrac{1}{\left(2^{\square} \times \square\right)^{3}}$

$= \dfrac{2^{\square(n+3)}}{\square^{-n-1} \times \square^{-n-1}} \times \dfrac{2^{\square(-n+2)} \times \square^{-n+2}}{5^{n+1}} \times \dfrac{1}{2^{\square(3)} \times \square^{3}}$

$= \square^{\square}$

$= \square$

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5) $\left[\dfrac{c^{-1}}{(ab)^{2}}\right]^{3} \div \left[\dfrac{b^{3}}{(ab)^{-3}}\right]^{-2}$

$= \dfrac{c^{-1(3)}}{(ab)^{2\times 3}} \div \dfrac{b^{3(-2)}}{(ab)^{-3(-2)}}$

$= \dfrac{c^{\square}}{(ab)^{\square}} \times \dfrac{(ab)^{\square}}{b^{\square}}$

$= \dfrac{b^{\square}}{c^{\square}}$

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6) $\dfrac{4^{2n}\left(4^{2n-1}\right)^{2n}}{4^{n+3}4^{3n-3}} \times \dfrac{1}{16^{2n^2-2n}}$

$= \dfrac{4^{2n} \cdot 4^{(2n-1)(2n)}}{4^{\square n}} \times \dfrac{1}{\square^{\square(2n^2-2n)}}$

$= \dfrac{4^{\square n^2}}{4^{\square n}} \times \dfrac{1}{4^{\square n^2 - \square n}}$

$= 4^{\square}$ $\qquad = \square$

2. Read each statements below. Write T if the statement is true and F if it is false. For what reason

☐ 1) $(0.000000005)^0 = 1$

☐ 2) $a^0 = 1$; a is any number

☐ 3) $10^{-5} < 0$

☐ 4) $-5^4 = (-5)^4$

☐ 5) $(0.5)^2 = (2)^{-2}$

☐ 6) $100^{10} = 10^{100}$

☐ 7) $\left(\dfrac{3}{7}\right)^{-4} < \left(\dfrac{7}{3}\right)^4$

☐ 8) $\dfrac{2^{10}}{10^2} > \dfrac{10^2}{2^{10}}$

☐ 9) $10^a + 10^a = 20^a$; a is integer number

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10) $10^a + 10^a = 10^{a+b}$; a and b is integer number

11) $10^a \times 10^b < 1$; a and b is integer number that $a + b < 0$

12) $10^a \times 10^b = 1$; a=0 and b=0

13) $a^{10} \times b^{10} = (a \times b)^{20}$; a and b is any number

14) $10^a \div 10^b > 1$; a and b is integer number that $a - b < 0$

15) $a^2 > a$; a is any number

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