

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

Worksheet 2 Exponents

1. Simplify the following with positive exponents only.

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

$$= \left[5^{\boxed{}} \cdot a^{\boxed{}} \right]^{\boxed{}} = \frac{1}{a^{\boxed{}}}$$

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

$$= \frac{3^{\boxed{}(n-1)}}{3^{n-1}} \times \frac{3^{\boxed{}(n-1)}}{3^{\boxed{}(n+1)}} = 3^{\boxed{}} \times 3^{\boxed{}} = 3^{\boxed{} - \boxed{}}$$

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

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

$$= \frac{2^{m+3}}{\boxed{}^{-m-1} \times \boxed{}^{-m-1}} \times \frac{\boxed{}^{-m+2} \times \boxed{}^{-m+2}}{5^{m+1}} = \frac{2^{\boxed{}} \times 3^{\boxed{}}}{5^{\boxed{}}} = 2^{\boxed{}} \times 3^{\boxed{}}$$

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

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

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

$$= \boxed{}^{\boxed{}}$$

$$= \boxed{}$$

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

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

$$= \frac{c^{\boxed{}}}{(ab)^{\boxed{}}} \times \frac{(ab)^{\boxed{}}}{b^{\boxed{}}}$$

$$= \frac{b^{\boxed{}}}{c^{\boxed{}}}$$

$$\begin{aligned}
 6) \quad & \frac{4^{2n} (4^{2n-1})^{2n}}{4^{n+3} 4^{3n-3}} \times \frac{1}{16^{2n^2-2n}} \\
 &= \frac{4^{2n} \cdot 4^{(2n-1)(2n)}}{4^{\boxed{n}} \cdot 4^{\boxed{}} \times \frac{1}{\boxed{}^{\boxed{} 2n^2-2n}} \\
 &= \frac{4^{\boxed{} n^2}}{4^{\boxed{} n}} \times \frac{1}{4^{\boxed{} n^2 - \boxed{} n}} \\
 &= 4^{\boxed{}} = \boxed{}
 \end{aligned}$$

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

8) $\frac{2^{10}}{10^2} > \frac{10^2}{2^{10}}$

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

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