Laws of Exponents

1. **Express as a single power:**

   A. $a^x \times b^x$

   B. $7^9 \times 2^9$

   C. $a^n \times a^n$

   D. $2^7 \times 3^7$

   E. $4^x \times 2^x$

   F. $p^m \cdot q^m$

   G. $9^3 \cdot x^3$

2. **Simplify:**

   A. $3^6 \times 3^3$

   B. $(-2)^5 \times (-2)^3 \times (-2)^2$

   C. $\left(\frac{6}{7}\right)^4 \times \left(\frac{6}{7}\right)^4$

   D. $x^p \times x^q$

   E. $x^{11} \div x^4$

   F. $(-a)^b \div (-a)^c$

   G. $\frac{9^8}{9^2}$

3. **Evaluate:**

   A. $\left(10^3\right)^4$

   B. $\left\{\frac{-1}{3}^2\right\}^4$

   C. $\left\{(-2)^n\right\}^3$

   D. $(a)^q - (a^q)^q$

4. Simplify and write the answer in exponential form.

A. $7^5 \times 6^5 \times 3^5$

B. $(2^{18} \div 2^{12}) \times 2^4$

C. $\left(\frac{3}{5}\right)^6 \times \left(\frac{5}{6}\right)^6$

D. $\left[\left(\frac{-1}{6}\right)^3\right]^4$

5. **Evaluate:**

A. $\frac{2^3 \times 3^4 \times 4}{3^2 \times 32}$

B. $(4^0 + 5^0 + 6^0) \times 3^0$

C. $\frac{3^9}{3^4 \times 3^5}$

D. $(82 \times 8)^6$

6. Simplify:

A. $\frac{3^5 \times 10^5 \times 125}{5^7 \times 6^4}$

B. $\left[\left(\frac{3}{4}\right)^5 \times \left(\frac{3}{4}\right)^2\right] \div \left(\frac{3}{4}\right)^7$

C. $\left[\left(\frac{-4}{7}\right)^3 \times \left(\frac{-4}{7}\right)^5\right] \div \left(\frac{16}{49}\right)^2$

7. Find the value of x.

A. $\left(\frac{343}{27}\right)^{5} \times \left(\frac{343}{27}\right)^{x} = \left(\frac{7}{3}\right)^{21}$

B. $\left(\frac{3}{4}\right)^{12} \div \left\{\left(\frac{3}{4}\right)^{3}\right\}^{6} = \left(\frac{3}{4}\right)^{x-3}$