Extension of Laws of Exponents

A. Choose the Correct Answer:

1. According to extended laws of exponents, $\left(\frac{a}{b}\right)^{m} \times \left(\frac{a}{b}\right)^{n}$ equals:

a) $\left(\frac{a}{b}\right)^{m-n}$ b) $\left(\frac{a}{b}\right)^{m+n}$

c) $\left(\frac{a}{b}\right)^{mn}$ d) $\left(\frac{a}{b}\right)^{n/m}$

2. The simplified form of $\left(\frac{3}{4}\right)^{2} \times \left(\frac{4}{3}\right)^{2}$ is:

a) 1 b) 2

c) $\frac{3}{2}$ d) 4

3. $\left(\frac{2}{5}\right)^{3} \div \left(\frac{2}{5}\right)^{2}$ simplifies to:

a) $\left(\frac{2}{5}\right)^{5}$ b) $\left(\frac{2}{5}\right)^{6}$

c) $\left(\frac{2}{5}\right)^{1}$ d) $\left(\frac{5}{2}\right)^{1}$

4. $(7^2)^3$ equals:

a) 7^6 b) 7^5

c) 7^9 d) 14^6

5. The expression $\frac{a^m b^n}{a^p b^q}$ simplifies to:

a) $a^{m+p}b^{n+q}$ b) $a^{m-p}b^{n-q}$

c) $a^{p-m}b^{q-n}$ d) $a^{mp}b^{nq}$

B. Write the Missing Terms to Complete the Sentences:

1. $\left(\frac{a}{b}\right)^{m} \div \left(\frac{a}{b}\right)^{n} = \left(\frac{a}{b}\right)^{\cdots}$

2. $\frac{x^m y^n}{x^p y^q} = x^{m-p} \times y^{\cdots}$

3. $(2^3)^4 = 2^{\cdots}$

4. $\left(\frac{a}{b}\right)^{0} =$ _____

5. $(a^m)^n = a^{\cdots}$

C. Figure out the answers to these questions:

1. Simplify $\left(\frac{5}{6}\right)^3 \times \left(\frac{5}{6}\right)^2$
2. Find the value of $\left(\frac{2}{7}\right)^5 \div \left(\frac{2}{7}\right)^2$
3. Simplify $(4^2)^3$ and write the answer
4. Evaluate $\left(\frac{3}{5}\right)^4 \times \left(\frac{5}{3}\right)^4$
5. Simplify $(x^2y^3)^2 \div (x^3y^2)$

D. Mark each sentence with a True (✓) or False (✗):

1. $\left(\frac{a}{b}\right)^m \times \left(\frac{a}{b}\right)^n = \left(\frac{a}{b}\right)^{m+n}$. _____
2. $\left(\frac{2}{3}\right)^3 \div \left(\frac{2}{3}\right)^2 = \left(\frac{2}{3}\right)^1$. _____
3. $\left(\frac{5}{6}\right)^2 \times \left(\frac{5}{6}\right)^2 = \left(\frac{5}{6}\right)^4$. _____
4. $(ab)^m = a^m b^m \; and \; \left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$. _____
5. $(x^2y^3)^2 = x^4y^6$. _____

E. Challenge yourself with these questions:

1. Find the value of $\left(\frac{3}{7}\right)^3 \times \left(\frac{7}{3}\right)^3$
2. Simplify $\left(\frac{6}{11}\right)^4 \div \left(\frac{6}{11}\right)^2$
3. Find the value of $(5^2)^3 \div 5^4$
4. Simplify $(a^3b^2)^2 \div (a^2b^3)$
5. Simplify $\left(\frac{2}{5}\right)^3 \times \left(\frac{5}{2}\right)^3$