

## Basic Exponent Laws: Assigned Problems

1. Write each expression as a single power.

a)  $4^3 \times 4^5$       c)  $(7^2)(7)$   
b)  $13^3 \times 13^{11}$       d)  $(12^3)(12^3)(12^3)$

2. Write each expression as a single power.

a)  $7^4 \div 7^3$       b)  $6^{16} \div 6^{11}$       c)  $\frac{9^3}{9}$       d)  $\frac{5^6}{5^3}$

3. Write each expression as a single power.

a)  $(2^3)^4$       b)  $(12^3)^3$       c)  $(10^7)^4$       d)  $((3^2)^3)^4$

4. Simplify. Write as a single power.

a)  $(2^5)^3 \times 2^3$       c)  $(7^8)(7^5)^2$       e)  $\frac{10(10^9)}{(10^2)^3}$   
b)  $5^9 \div (5^3)^2$       d)  $\frac{(8^2)^5}{8^8}$       f)  $\frac{(4^7)^3}{4^9(4^{11})}$

5. a)  $\left(\frac{4}{3}\right)\left(\frac{4}{3}\right)^2$       c)  $\left(\left(\frac{2}{5}\right)^2\right)^2$

b)  $\left(\frac{1}{9}\right)^4 \div \left(\frac{1}{9}\right)^2$       d)  $\left(\frac{5}{4}\right)^5\left(\frac{5}{4}\right)^3 \div \left(\frac{5}{4}\right)^6$

6. Simplify.

a)  $x^4(x^2)^2$       c)  $(y(y^6))^3$       e)  $a^2 a^2 a^2$   
b)  $\frac{(m^5)^2}{m^8}$       d)  $((a^2)^2)^2$       f)  $\frac{b(b^5)b^4}{b^5}$

7. Simplify.

a)  $(3y)^3$       b)  $(5x^2y)^3$       c)  $\frac{(2a)^3(2a)}{(2a)^2}$

## FINAL ANSWERS

1. a)  $4^8$                       b)  $13^{14}$                       c)  $7^3$                       d)  $12^9$   
2. a) 7                              b)  $6^5$                       c)  $9^2$                       d)  $5^3$   
3. a)  $2^{12}$                       b)  $12^9$                       c)  $10^{28}$                       d)  $3^{24}$

4. a)  $2^{18}$                       c)  $7^{18}$                       e)  $10^4$   
b)  $5^3$                       d)  $8^2$                       f) 4

5. a)  $\left(\frac{4}{3}\right)^3 = \frac{64}{27}$                       c)  $\left(\frac{2}{5}\right)^4 = \frac{16}{625}$   
b)  $\left(\frac{1}{9}\right)^2 = \frac{1}{81}$                       d)  $\left(\frac{5}{4}\right)^2 = \frac{25}{16}$

6. a)  $x^8$                       c)  $y^{21}$                       e)  $a^6$   
b)  $m^2$                       d)  $a^8$                       f)  $b^5$

7. a)  $27\gamma^3$                       b)  $125x^6\gamma^3$                       c)  $4a^2$