

Simplify each expression.

1)  $(a^2b^3)^4$

2)  $(-4x^2y^3z^2)^4$

3)  $(-5x^5y^2z^5)^3$

4)  $(a^{-4}b)^3$

5)  $(-4m^2n^4pq^3)^2$

6)  $(-3x^3y^5z^7)^3$

7)  $\left(\frac{m^4}{n^5}\right)^3$

8)  $\left(\frac{1}{4}x^3\right)^2$

9)  $\left(\frac{5x^2}{6}\right)^2$

10)  $\left(\frac{r^4}{t^5}\right)^3$

11)  $\left(\frac{1}{5b^5}\right)^3$

12)  $\left(\frac{3x^3}{4xy^3}\right)^2$

*Answer Key*

1)  $a^8b^{12}$

2)  $256x^8y^{12}z^8$

3)  $-125x^{15}y^6z^{15}$

4)  $a^{-12}b^3 = \frac{b^3}{a^{12}}$

5)  $16m^4n^8p^2q^6$

6)  $-27x^9y^{15}z^{21}$

7)  $\frac{m^{12}}{n^{15}}$

8)  $\frac{x^6}{16}$

9)  $\frac{25x^4}{36}$

10)  $\frac{r^{12}}{t^{15}}$

11)  $\frac{1}{125b^{15}}$

12)  $\frac{9x^6}{16x^2y^6}$