4.8 Additive Law of Exponents in a Multivariate Monomial

• Example 1

Simplify.

$2x^2y^{-4}z \cdot 3x^{-6}y^8 \cdot 12x^{-3}z^{-1}$

We begin by gathering like terms:

$(2 \cdot 3 \cdot 12)(x^2 \cdot x^{-6} \cdot x^{-3})(y^{-4} \cdot y^8)(z \cdot z^{-1})$

Now we apply the laws of exponents

$72x^{2-6-3}y^{-4+8}z^{1-1}$

$= 72x^{-7}y^4z^0$

$= \dfrac{72y^4}{x^7}$

CHECK YOURSELF 1

Simplify

$z^2x^3y^{-3} \cdot 3y^5x^{-4} \cdot 10y^{-7}$

CHECK YOURSELF ANSWER

1. $\dfrac{30z^2}{xy^5}$.

4.8 Exercises

Name

Section Date

ANSWERS

1.

2.

3.

4.

5.

6.

7.

8.

Simplify.

1. $x^2y^{-2} \cdot x^5yz^5 \cdot 9x^{-2}y^{-4}$

2. $4y^{-3}x^{-5}z^{-2} \cdot 8yz \cdot 2x^5y^2$

3. $8x^{-12}y^{-4} \cdot x^{-2}y^8$

4. $13xyz \cdot 2x^5y^{-4}z^{-1} \cdot 3y^6$

5. $x^3y \cdot x^2y^4$

6. $m^2n^3 \cdot mn^4$

7. $\dfrac{x^2}{y^3z} \cdot \dfrac{xy}{z^4} \cdot \dfrac{y^2z^3}{x^9}$

8. $\dfrac{y^{-4}z}{x^{-2}} \cdot \dfrac{xy}{z^{-6}} \cdot \dfrac{x^{-5}z^{-2}}{y^7}$