

Exercise 3

Use the Law of Exponents to rewrite and simplify the expression.

$$(a) \quad b^8(2b)^4 \qquad (b) \quad \frac{(6y^3)^4}{2y^5}$$

Solution

Part (a)

$$\begin{aligned} b^8(2b)^4 &= b^8(2^4b^4) \\ &= b^8(16b^4) \\ &= 16b^{8+4} \\ &= 16b^{12} \end{aligned}$$

Part (b)

$$\begin{aligned} \frac{(6y^3)^4}{2y^5} &= \frac{[(2)(3)y^3]^4}{2y^5} \\ &= \frac{2^43^4(y^3)^4}{2y^5} \\ &= \frac{2^43^4y^{(3)(4)}}{2y^5} \\ &= \frac{2^43^4y^{12}}{2y^5} \\ &= 2^{4-1}3^4y^{12-5} \\ &= 2^33^4y^7 \\ &= 648y^7 \end{aligned}$$