

Exercise 22**Radicals and Exponents** Evaluate each expression.

$$(a) 3^8 \cdot 3^5 \qquad (b) \frac{10^7}{10^4} \qquad (c) (3^5)^4$$

Solution

Since the two numbers have the same base, the exponents can be combined into one.

Part (a)

$$\begin{aligned} 3^8 \cdot 3^5 &= 3^{8+5} \\ &= 3^{13} \\ &= 1\,220\,703\,125 \end{aligned}$$

Part (b)

$$\begin{aligned} \frac{10^7}{10^4} &= 10^{7-4} \\ &= 10^3 \\ &= 10 \times 10 \times 10 \\ &= 1000 \end{aligned}$$

Part (c)

$$\begin{aligned} (3^5)^4 &= 3^{5(4)} \\ &= 3^{20} \\ &= 3\,486\,784\,401 \end{aligned}$$