Exercise 21

Radicals and Exponents Evaluate each expression.

(a) $5^3 \cdot 5$ **(b)** $5^4 \cdot 5^{-2}$ **(c)** $(2^2)^3$

Solution

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

Part (a)

$$\begin{aligned} 5^3 \cdot 5 &= 5^3 \cdot 5^1 \\ &= 5^{3+1} \\ &= 5^4 \\ &= 5 \times 5 \times 5 \times 5 \\ &= 625 \end{aligned}$$

Part (b)

$$\begin{aligned} 5^4 \cdot 5^{-2} &= 5^{4-2} \\ &= 5^2 \\ &= 5 \times 5 \\ &= 25 \end{aligned}$$

Part (c)

$$\begin{aligned} (2^2)^3 &= 2^{2(3)} \\ &= 2^6 \\ &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \\ &= 64 \end{aligned}$$