

Exercise 1.5

The most powerful engine available for the classic 1963 Chevrolet Corvette Sting Ray developed 360 horsepower and had a displacement of 327 cubic inches. Express this displacement in liters (L) by using only the conversions $1 \text{ L} = 1000 \text{ cm}^3$ and $1 \text{ in.} = 2.54 \text{ cm}$.

Solution

Start with 327 in^3 and arrange the appropriate conversion factors so that the desired units remain.

$$327 \text{ in}^3 \times \left(\frac{2.54 \text{ cm}}{1 \text{ in}} \right)^3 \times \frac{1 \text{ L}}{1000 \text{ cm}^3} = \frac{(327)(2.54)^3(1) \text{ L}}{(1)^3(1000)} \approx 5.36 \text{ L}$$

Note that each fraction has a value of 1, so squaring or cubing one doesn't change anything. It's done here in order to cancel in^3 .