

## Problem 1.27

[Difficulty: 1]

---

**1.27** A farmer needs 4 cm of rain per week on his farm, with 10 hectares of crops. If there is a drought, how much water (L/min) will have to be supplied to maintain his crops?

---

**Given:** Acreage of land, and water needs.

**Find:** Water flow rate (L/min) to water crops.

**Solution:** Use Table G.2 and other sources (e.g., Machinery's Handbook, Mark's Standard Handbook) as needed.

The volume flow rate needed is  $Q = \frac{4 \cdot \text{cm}}{\text{week}} \times 10 \cdot \text{hectare}$

Performing unit conversions  $Q = \frac{4 \cdot \text{cm} \times 10 \cdot \text{hectare}}{\text{week}} = \frac{0.04 \text{ m} \times 10 \cdot \text{hectare}}{\text{week}} \times \frac{1 \times 10^4 \cdot \text{m}^2}{1 \cdot \text{hectare}} \times \frac{1000 \text{ L}}{\text{m}^3} \times \frac{1 \cdot \text{week}}{7 \cdot \text{day}} \times \frac{1 \cdot \text{day}}{24 \cdot \text{hr}} \times \frac{1 \cdot \text{hr}}{60 \cdot \text{min}}$

$$Q = 397 \cdot \frac{\text{L}}{\text{min}}$$