

## Problem 44

A furlong is 220 yd. A fortnight is 2 weeks. Convert a speed of one furlong per fortnight to millimeters per second.

### Solution

Convert the speed to the desired units by multiplying by the appropriate conversion factors.

$$\begin{aligned} 1 \frac{\text{furlong}}{\text{fortnight}} &= 1 \frac{\cancel{\text{furlong}}}{\cancel{\text{fortnight}}} \times \frac{220 \cancel{\text{yd}}}{1 \cancel{\text{furlong}}} \times \frac{3 \cancel{\text{ft}}}{1 \cancel{\text{yd}}} \times \frac{381 \cancel{\mu}}{1250 \cancel{\text{ft}}} \times \frac{1000 \text{ mm}}{1 \cancel{\mu}} \\ &\quad \times \frac{1 \cancel{\text{fortnight}}}{2 \cancel{\text{weeks}}} \times \frac{1 \cancel{\text{week}}}{7 \cancel{\text{days}}} \times \frac{1 \cancel{\text{day}}}{24 \cancel{\text{h}}} \times \frac{1 \cancel{\text{h}}}{60 \cancel{\text{min}}} \times \frac{1 \cancel{\text{min}}}{60 \text{ s}} \\ &= \frac{220 \times 3 \times 381 \times 1000}{1250 \times 2 \times 7 \times 24 \times 60 \times 60} \frac{\text{mm}}{\text{s}} \\ &\approx 0.166 \frac{\text{mm}}{\text{s}} \end{aligned}$$