Dimensional homogeneity and conversion using unit ratios

Engineering Fluid Mechanics

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Dimensions and units

LENGTH (L)

TIME (T)

MASS (M)

V = L/T

F = M * L/T2

Dimensions and units

cm/s → V IN SI UNITS

MILES/hr → V IN U.S. CUSTOMARY

Dimensional homogeneity

$M + M \simeq M$

$10\ kg + 10\ km \simeq$

F IN SI UNITS

$N \simeq$ _____

Conversion with unit ratio

$10\ kg + 10\ lbm =$

$1\ kg = 2.2046\ lbm$

$$\left(\frac{1\ kg}{2.2046\ lbm}\right) = 1$$

$$10\ kg + 10\ lbm\left(\frac{1\ kg}{2.2046\ lbm}\right) =$$

$10\ kg + 21.53597\ kg = 14.5359$

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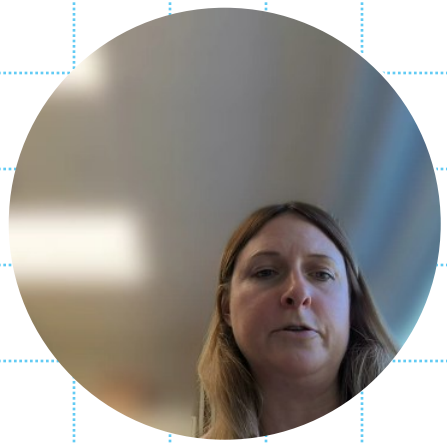

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