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Sketch of Scenario –



List (next to your sketch – in symbolic form) what is known & List (next to your sketch – in symbolic form) what is unknown/what is desired to be known.

$V = 5 \text{ m/s}$ $\Delta d = 100 \text{ km}$

List Related/Relevant/Pertinent Relationships, Formulas, Laws, Conversion Factors, etc.. Convert all numbers to (MKS) common units as necessary.

$V_{\text{avg}} = \frac{\Delta d}{\Delta t}$ $d = v(t)$

If an unknown quantity can be expressed in terms of a known quantity – please indicate that.

Done Unknown Zone

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List Related/Relevant/Pertinent Relationships, Formulas, Laws, Conversion Factors, etc..
Convert all numbers to (MKS) common units as necessary.

$\frac{d}{v} = \frac{t}{v}$ $t = \frac{d}{v}$

If an unknown quantity can be expressed in terms of a known quantity – please indicate that.

Manipulate relationships/formulas (isolate unknown variable(s)) and plug in known quantities as

Done Unknown Zone

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d = distance	Q = heat
Δd = change in distance	R = resistance
f = frequency	Δt = change in time
F = force	ΔT = change in temperature
Δh = change in height	T = period
I = current	v = velocity
KE = kinetic energy	v_i = initial velocity
λ = wavelength	v_f = final velocity
m = mass	Δv = change in velocity
p = momentum	V = voltage
P = power	W = work

V v D or d

Definitions

G = Universal gravitational constant = $6.67 \times 10^{-11} \frac{N \cdot m^2}{kg^2}$ *a = acceleration*

k = Coulomb constant = $8.99 \times 10^9 \frac{N \cdot m^2}{C^2}$

c = speed of electromagnetic waves = 3.00×10^8 m/s

$g \approx 10 \text{ m/s}^2$ $1 \text{ N} = \frac{1 \text{ kg} \cdot \text{m}}{\text{s}^2}$ $1 \text{ J} = 1 \text{ N} \cdot \text{m}$ $1 \text{ W (watt)} = \frac{1 \text{ J}}{\text{s}}$

*** => For constant a only !**

Done Unknown Zone