

CLASS NOTES ON ACCELERATION FORMULAS PART ONE!
WHAT IS THE DEFINITION OF AVERAGE VELOCITY? (assuming constant acceleration).

WHAT IS THE DEFINITION OF AVERAGE ACCELERATION?

HOW DO YOU GET DISPLACEMENT?

Use these formulas to answer:

Bob goes from 3 m/s to 14 m/s in 21 seconds.
What is his average velocity?

What is his average acceleration?

What is his displacement?

With the same acceleration, when will he be going 24 m/s?

How far will he have gone in that time?

WHAT IS THE DEFINITION OF AVERAGE VELOCITY? (assuming constant acceleration).

$$V_{avg} = \text{Change in Dis}/\text{Change in Time} = D/T \text{ OR}$$

$$V_{avg} = (V_i + V_f) / 2$$

WHAT IS THE DEFINITION OF AVERAGE ACCELERATION?

A = change in vel/ change in time

$$A = (V_f - V_i) / T$$

HOW DO YOU GET DISPLACEMENT?

$$D = V_{avg} * T \quad D = (V_i + V_f)/2 * T$$

Use these formulas to answer:

Bob goes from 3 m/s to 14 m/s in 21 seconds.

What is his average velocity?

$$V_{avg} = (V_i + V_f) / 2 = (3 \text{ m/s} + 14 \text{ m/s}) / 2 = 17/2 = 8.5 \text{ m/s}$$

What is his average acceleration?

$$A = (V_f - V_i) / T = (14 \text{ m/s} - 3 \text{ m/s}) / 21 \text{ s} = 11 \text{ m/s} / 21 \text{ s} = .524 \text{ m/s}^2$$

What is his displacement?

$$D = V_{avg} * T = 8.5 \text{ m/s} * 21 \text{ s} = 178.5 \text{ m}$$

With the same acceleration, when will he be going 24 m/s?

$$A = .524 \text{ m/s}^2$$

$$V_i = 3 \text{ m/s}$$

$$V_f = 24 \text{ m/s}$$

$$T = ??$$

$$D = ??$$

$$A = (V_f - V_i) / T$$

$$.524 \text{ m/s}^2 = (24 \text{ m/s} - 3 \text{ m/s}) / T$$

$$.524 \text{ m/s}^2 = (21 \text{ m/s}) / T$$

$$T = (21 \text{ m/s}) / .524 \text{ m/s}^2$$

$$T = 40.09 \text{ sec}$$

How far will he have gone in that time?

$$D = V_{avg} * T = (V_i + V_f) / 2 * T = (24 + 3) / 2 * 40.09$$

$$= 13.5 * 40.09$$

$$= 541 \text{ meters}$$