Monday, January 14

Clicker Questions

Clicker Question 1

Definite integrals and units

Suppose the variable t represents time in hours, and the function $P(t)$ represents the power level of a generating station, measured in megawatts.

What are the units of $\int_0^{24} P(t)\,dt$?

A. megawatts per hour
B. megawatts
C. megawatt-hours — same units as $\sum_{i=1}^{n} P(x_t^*)\Delta t$
D. none of the above

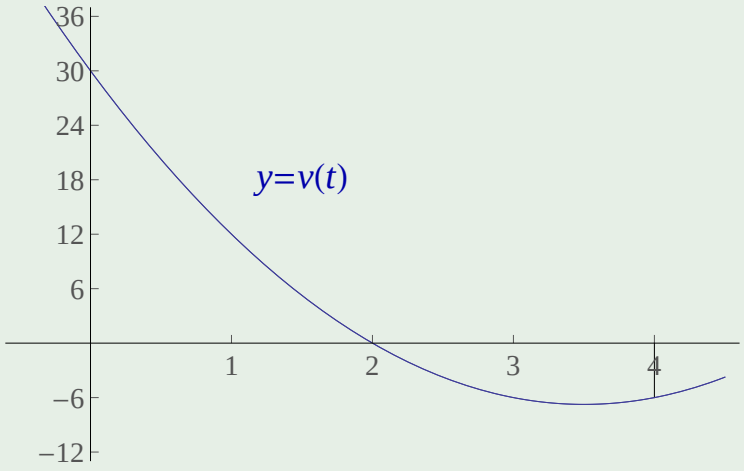
Side note: power is the rate of change of energy, so

$$\int_0^{24} P(t)\,dt = \int_0^{24} E'(t)\,dt = E(24) - E(0).$$

Clicker Question 2

Distance and displacement

A particle moves along a line with velocity $v(t) = 3t^2 - 21t + 30$ cm/sec. What is its displacement after 4 seconds? What is the total distance traveled in the first 4 seconds?



A. displacement = 16 cm; total distance = 36 cm

B. displacement = 16 cm; total distance = 26 cm

C. displacement = 26 cm; total distance = 36 cm

D. displacement = 10 cm; total distance = 26 cm

E. none of the above