Date ..../..../....

example: 7

- if the relation between x and t by $x = e^{2t} - 2e^{-2t}$ prove that $V^2 = 4(x^2+8)$
- $F = 4x$

Solution

$x^2 = e^{4t} + 4e^{-4t} - 4$

$V = 2e^{2t} + 4e^{-2t}$

$V^2 = 4e^{4t} + 16e^{-4t} + 16$

$= 4[e^{4t} + 4e^{-4t} + 4]$

$4[e^{4t} + 4e^{-4t} + 8 - 4]$

$V^2 = 4[x^2 + 8]$ #

← عليه تفاضل

$F = [4e^{2t} - 8e^{-2t}]$

$= 4[e^{+2t} - 2e^{-2t}]$

$F = 4x$ #

مقرر chapter 1

من ← examples 3:11

11, 10, [illegible]

تبع السكشن

Date / / No

example 8 A large stone is falling though a layer of mud. At time t seconds, the depth of the stone in metres below the surface this is given by $x(t) = 20(1 - e^{-\frac{1}{2}})$

Solution

$$x'(t) = \frac{20}{2} e^{-\frac{1}{2}}$$

$$x''(t) = -5e^{-\frac{1}{2}}$$

$$x'(1) = 10e^{-\frac{1}{2}} \longrightarrow \text{Positive}$$

$$x''(1) = -5e^{-\frac{1}{2}} \longrightarrow \text{negative}$$

- السرعة اتجاهها لأسفل من نفس اتجاه حركة الصخرة
- الحركة لأعلى
- السرعة تزداد

السرعة اتجاهها لأعلى عكس اتجاه حركة الصخرة - الحجة لأسفل
∴ السرعة تقل

$$** \leftarrow e^{-\frac{t}{2}} = e^{-\frac{\infty}{2}} = e^{-\infty} = \frac{1}{e^{\infty}} = \frac{1}{\infty} = 0$$

$$\because t \longrightarrow \infty$$

$$x = 20$$

$$x' = \text{Zero}$$

$$x'' = \text{Zero}$$

Date / / No

example 9

A particle moves in a straight line it is initially at rest at the origin the the acceleration of the particle is given

$$x''(t) = \frac{1}{3}\cos 3t.$$

Solution

مشتق ← تكامل

$$x'(t) = 3 \times \frac{1}{3}\sin 3t + A$$

$$x'(t) = \frac{1}{9}\sin 3t + A$$

من البداية

$x_0 = v_0 = t_0 = 0$

$$0 = \frac{1}{9}\sin 0 + A \rightarrow \text{ثابت التكامل}$$

$$v(t) = \frac{1}{9}\sin 3t$$

$$x(t) = \frac{-1}{27}\cos 3t + C \rightarrow \text{ثابت التكامل}$$

$$\therefore C = \frac{1}{27} \#$$

Finished Chapter 1