COLLEGE
Tanta Engineering

إعدادي 2020

ديناميكا

الحركة في خط مستقيم

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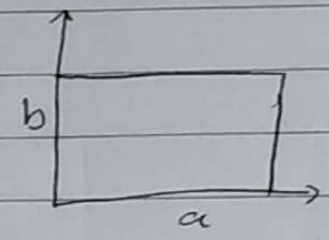
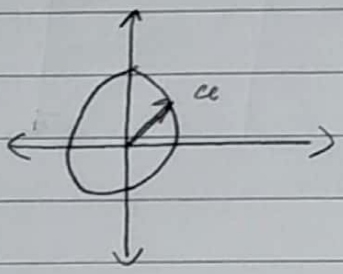
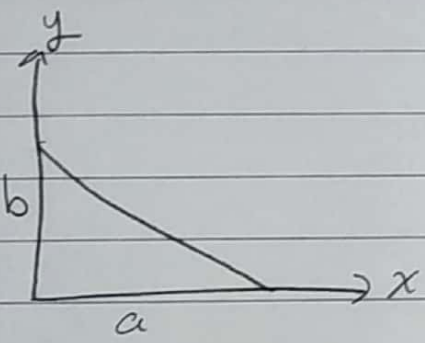
عزم القصور الذاتي.



$$I_x = \frac{ab^3}{3} \quad , \quad I_y = \frac{a^3 b}{3}$$



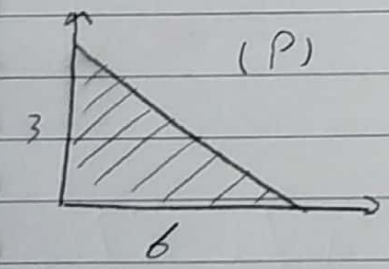
$$I_x = I_y = \frac{I_o}{2} = \frac{\pi a^4}{4}$$



$$I_x = \frac{ab^3}{12}$$

$$I_y = \frac{a^3 b}{12}$$

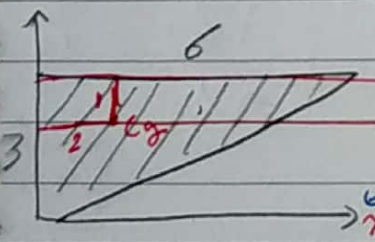
مثال:- (P



$$I_x = \frac{6 \times 3^3}{12} = \frac{27}{2}$$ من الجدول

$$I_y = \frac{6^3 \times 3}{12} = 54$$ من الجدول

(ب

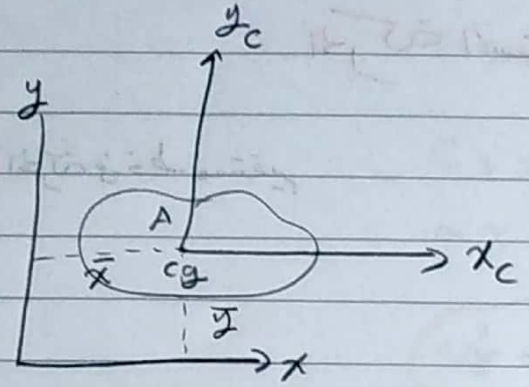


$$I_y = \frac{6^3 \times 3}{12} = 54$$

$$I_{x'} = \frac{3^3 \times 6}{12} = \frac{27}{2}$$

C_y (2,2)

← نظرية نقل المحاور المتوازية



$$I_x = I_{x_c} + \bar{y}^2 A$$

$$I_y = I_{y_c} + \bar{x}^2 A$$

باقي مثال (ب)

$$I_{x'} = I_{x_c} + 1^2 \times 9$$

$$\frac{27}{2} = I_{x_c} + 9$$

$$I_{x_c} = 4,5$$

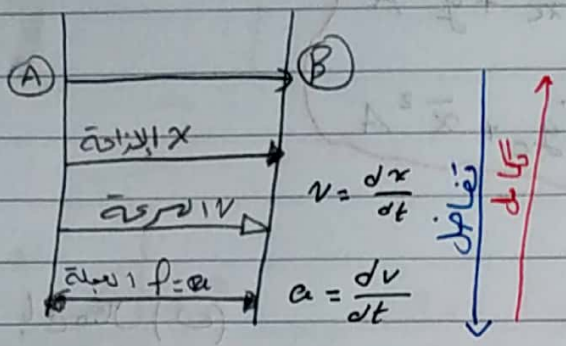
$$I_x = I_{x_c} + 2^2 \times 9$$

$$= 4,5 + 36$$

$$= 40,5$$

Planer Motion الحركة المستوية

١) الحركة في خط مستقيم



⇐ احتمالات العجلة

(1 $f=0 \Leftarrow V=Con \Leftarrow v=\frac{\Delta x}{\Delta t}$

(2 $f=c \Leftarrow \int c\,dt=\int dv \Longleftarrow ct=v+C$

الشروط الابتدائية I.C

$t=0 , x=x_0 , v=v_0$

$0=v_0+C$

$C_1=-v_0$

$\therefore v=v_0+at$ ← v, t → I

$\because v=\frac{dx}{dt}=v_0+at$

$dx=(v_0+at)\,dt$

$x=v_0t+\frac{at^2}{2}+C_2$

$x_0=0+0+C_2$

$x=v_0t+\frac{1}{2}at^2+x_0$

$x-x_0=v_0t+\frac{1}{2}at^2$ ← x, t → II

$f=\frac{dv}{dt}$

$f=\frac{dv}{dx}\frac{dx}{dt}$ V

$f=v\frac{dv}{dx}$

$f=a=v\frac{dv}{dx}$

$\int a\,dx=\int v\,dv$

$ax=\frac{v^2}{2}+C_3$

$f=\frac{d^2V}{ds^2}\frac{ds}{dx}\frac{dx}{dt}$

$f=\frac{dv}{dt}\frac{dt}{dx}$ $\frac{1}{V}$

$$a x_0 - \frac{v_0^2}{2} + C_3$$

$$C_3 = a x_0 - \frac{v_0^2}{2}$$

$$a x = \frac{v^2}{2} + a x_0 - \frac{v_0^2}{2}$$

$$v^2 = v_0^2 + 2a(x - x_0) \quad \xrightarrow{v, x} \quad \text{III}$$

$f = f_n \begin{cases} \rightarrow t \\ \rightarrow x \\ \rightarrow v \end{cases}$ (3

$$f = t^2 = \frac{dv}{dt}$$

$$\int t^2 dt = \int dv$$

$$f = x^2 = v \frac{dv}{dx}$$