Date :

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Kelas : B

Kuadrat F : $-bu^2$ dengan pengaruh gaya gesekan be

bergerak vertikal keatas

$\vec{U} \uparrow \quad \downarrow \vec{P}$ $\quad \Sigma F = m.a$

$\vec{w}.\vec{f} = m.a$

$-m.g.bu^2 = m.a$

$$\int_{v_0}^{vt} \frac{dv}{-g - \frac{bu^2}{m}} = \int_0^t dt$$

$$\int_{v_0}^{vt} \frac{\frac{1}{v}}{-g - bu^2/m} \cdot \frac{dv}{} = \int_0^t dt$$

$\rightarrow -g - \frac{bu}{m} \cdot u$

$\frac{-b}{m} du = dv$

$dv = \frac{m}{b} - du$

$\int^{1/u} \left(-\frac{m}{b} - du\right) = -\frac{m}{b} \int 1/u \, dv = \frac{m}{b} \ln(u)$

$\int_{v_0}^{vt} \left(-g \cdot \frac{1}{bu^2/m}\right) du = \int_0^t dt$

$-\frac{m}{bv} \ln(u) = t$

~~$-\frac{m}{bv} \ln\left(\frac{-g \cdot bu^2}{m}\right)$~~

~~$= -g \times bu^2/m \, t$~~

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$$-\frac{m}{6u}\ln\left[-g-\frac{bu^2}{m}\right]_{vo}^{vt}=t$$

$$-\frac{m}{6u}\left(\ln\left(\frac{-g\times bu^2/m}{-g\times bu^2/m}\right)\right)_t^v$$

$$-g-\frac{6ut}{m}\sim e^{-6\,ut/m}$$

$$-g-\frac{6vo}{m}$$

$$-g-\frac{6}{m}vt\,(-g-{}^{6}/_{m}v_0)\,e^{-bu^2/m}$$

$$vt=-\frac{mg}{6u}-\left(\frac{-gm}{6u}-vo\right)e^{-\frac{6u^2}{m}}$$

$$f=-w$$

$$bu=m.g$$

$$vt=mg/6u$$

$$v(t)=VT.(VT-v_0)\,e^{-\frac{6ut}{m}}$$

$$a(t)=\frac{du}{dt}(t)=\frac{d}{dt}(vt=[v_0+VT)\,e^{-6us/m}$$

$$=\frac{-6v}{m}\left(v_0+\frac{6u}{m}VT\right)e^{-bvt/m}$$

$$a(t)=\left(-g-\frac{6}{m}v_0\right)e^{-6vt/m}$$

$$v(t)=\frac{dy}{dt}(t)$$

$$\int_{yo}^{4x}dy(t)=\int_0^{\circ}v(t)\,dt$$

$$y(t)=\int_v^t VT-(-v_0+VT)\,e^{-\frac{6u}{m}}$$

$$y(t)=(VTt(-v_0+VT)\,|-{}^{m}/_{6u})\,e^{-6vt/m}$$

$$y(t)=(VTt=(v_0+v_T)=\left(\frac{-m}{6u}\right)e^{-tvt/m}]-[(-v_0-v_5)-{}^{m}/_{6v})]$$

$$y(t)=VTt-[{}^{-m}/_{6u})(-v_0+VT)(e^{-6ut/m})$$

$$y(t)=VTt-m/bu\,(-v_0+VT)(1-e^{-bvt/m})$$

$$y(t)=VTt-m/6m\,(-v_0-VT)(1-e^{-6vt/m})$$

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$a(t) = (-g - 6v/(m v_0))\, e^{-bv\,t/m}$

aproksimasi:

$e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots$

$e^{-6vt/m} = 1 - 6vt/m + 1/2\,(6vt/m)^2 + \dots$

$y(t) = v_T t + m/6v\,[-v_0 - v_T)(1 - e^{-6vt/m})$

$y(t) = v_0 t + 1/2 \times \frac{6v}{m} = v_0 t^2 + 1/2 \times 6v/m\,(-mg/6v)\,t^2$

$6 = 0$

$y(t) = v_0 t - 1/2\, g t^2$

$v(t) = v_T - (-v_0 + v_T)\, e^{-6vt/m}$

$v(t) = v_r - (-v_0 + v_T)(1 - \frac{6vt}{m})$

$v(t) = v_0 + \frac{6v}{m} \cdot v_0 t - gt$

$6 = 0$

$a(t) = (-g - \frac{6v}{m} v_0)\, e^{-6vt/m}$

$a(t) = (-g - \frac{6v}{m} v_0)(1 - \frac{6vt}{m})$

$a(t) = -g + g\frac{6vt}{m} - \frac{6v}{m} v_0 b^2 v^2/m+2 \cdot v_0 t$

$6 = 0$

$vt = -g$