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Mini lab

A. $x(t) = -3.886x^2 + 0.9534x + 0.4192$

$v(t) = -7.772x + 0.9534$

$a(t) = -7.772$

B. $t = mg - ma$ $\quad m = .0515kg \quad g = 9.81 \quad a = -7.772$

$t = m(g - a)$

$t = .0515(9.81 - 7.772)$

$t = .1049$

C. $T = mg - ma$

$\Sigma\tau = T \cdot r$

$T_r = I\alpha$

$(mg - ma)r = I\alpha$

$a = \alpha r$

$$I = \frac{T_r}{a/r} = \frac{Tr^2}{a} = \boxed{\frac{(mg - ma)r^2}{a}}$$

D. $\Sigma\tau = I\alpha$

$T \cdot r = I\alpha$

$\alpha \cdot r = a$

$\alpha = a/r \qquad R = .0365m$

$T \cdot r = I \frac{a}{r}$

$.1049r = I \cdot 7.772 \cdot 2/r$

$$I = \frac{.1049}{7.772} \quad r^2 = \boxed{1.798 \cdot 10^{-5} \ kg \cdot m^2}$$