

Name _____

Homework Assignment #12 due in class Wednesday November 22

Staple this cover sheet in front of your solutions.

Write the requested answers on this sheet, and do the detailed solutions on your own paper.

[61] Problem 7.2 ★

Answer: Write down a *general solution* of Lagrange's equation.

[62] Problem 7.3 ★

Answer: Write down the solution with these initial values: $x(0) = A$, $v_x(0) = 0$ and $y(0) = 0$, $v_y(0) = B$. Prove that the trajectory is an ellipse, and sketch a graph of the trajectory.

[63] Problems 7.8 ★★

Answer: Write general solutions for $X(t)$ and $x(t)$.

[64] Problems 7.14 ★

Answer: The so-called "crude model" does not resemble a real yo-yo at all. In a real yo-yo there are two radii – the large radius (R) of the sides and the much smaller radius (r) of the axle. Calculate the acceleration for the real yo-yo and write the result here.

[65] Problem 7.21 ★

Answer: If the the bead is released at time 0 with $r = R/2$ and $dr/dt = 0$, calculate the time when the bead flies off the end of the rod; $R =$ length of the rod. Write the time here.

[66] Problem 7.31 ★★

Answer: Try to solve the equations with $x(t) = A \exp(i\omega t)$ and $\phi(t) = B \exp(i\omega t)$. If possible determine ω .

[67] Problem 7.43 ★★★ [Computer]

Answer: Hand in the computer program and the plots.