**CSUC Spring Term 2020 Physics 204A Portfolio Problem for Week 15:**
**Due Monday, May 11, by Noon on our class Blackboard site: 202-PHYS204A-05-4569**

**Dear Class: This is the seventh (and Week15) Portfolio Problem Set. This is an oscillation problem which really happened and was observed by a physicist friend of mine who was visiting Chico! Knowing some physics could save you a world of grief …**

**Draw lots of pictures! Don't rush! There is a lot to be learned here. This is an open book and unlimited time exercise.**

# Simple Harmonic Oscillation:

You're riding the mechanical bull at the **CRAZY HORSE SALOON** !

On the night you're there, this prodigious beast executes vertical S.H.O. with an amplitude of .25m at 1.5 Hz. Since you've finished your *Physics Final Exam* you're a little light headed. Summoning all your bravado, you decide to ride without holding on! The bull passes through its equilibrium point (i.e. zero point) at time t = 0 and proceeds upwards. You notice shortly thereafter that you've gone ballistic!

## I. Provide an accurate graph of the person's trajectory from the moment t = 0 until the saddle is regained. On the same graph portray the trajectory of the saddle.

## II. Please answer the following questions:

**a)** What is your height above the equilibrium point when you leave the saddle?
**b)** What is your velocity when you leave the saddle?
**c)** What is the time when you leave the saddle ?
**d)** What is the equation of your trajectory while on your ballistic ride?
**e)** When do you rejoin the saddle and what is your height then ?
**f)** What is your velocity and what is the saddle's velocity at the moment you rejoin?
**g)** How pleasant was this experience ?