Phys 111
Fall 2019
Exam #1
09/24/2019
Time Limit: 75 Minutes

Full Name: _____

(Print Clearly)

Version A

This exam contains 8 pages and 12 questions: 5 multiple choice (50 pts), 4 single part free response (80 pts), and 3 multi-part free repsonse (120 pts). Your score is graded out of 250 points. This exam is closed-resources, but some reference constants, conversions, and equations have been provided. The use of a **TI 30X IIS** non-graphing, non-programmable calculator is permitted, but cellphones are **not**.

Please use the attached extra paper instead of cramming your work on the pages with problem statements. If I can not read your work, I can not give you credit. Work **must** be explicitly shown to earn full credit including a justification of your methods.

Staple all of your scratch to the exam when you turn it in. A good test taking strategy is to cross out incorrect work instead of erasing it to save some time.

Good Luck!

Physical Constants

$$g \approx 10.0\ m/s^2$$

Conversion Factors

$$10^3\ m = 1\ km$$

$$3600\ s = 1.0\ h$$

Physical Relationships

$$\mathbf{v_{ag}} = \mathbf{v_{ab}} + \mathbf{v_{bg}}$$

$$v = 2\pi r/T$$

$$a_c = v^2/r$$

$$v_s = v_o + a_s t$$

$$s = s_o + v_{os}t + \frac{1}{2}a_s t^2$$

$$v_s^2 = v_o^2 + 2a_s(s - s_o)$$

$$\sum \mathbf{F} = m\mathbf{a}$$

$$f_s \leq \mu_s F_N$$

$$f_k = \mu_k F_N$$