Name _____

Free Fall (p. 72 – 75)

I. Free Fall

1. **Define the term free fall.**

Free Fall – motion of a body when air resistance is negligible and the action can be considered due to gravity alone.

II. Acceleration Due To Gravity

1. **Who studied the motion of falling objects about 400 years ago?**

Galileo Galilei

Leaning Tower of Pisa

2. **All objects in free fall have the same acceleration.**

Circle One : (True) False

DEMO

3. **The average rate of free fall on Earth is :**

p. 72

$g =$ 9.8 meters/sec.^{2}

Small variations on Earth.

4. **Define the term acceleration due to gravity.**

Acceleration Due To Gravity – acceleration of an object in free fall that results from the influence of Earth's gravity

5. **As an object free falls, the velocity ~~remains constant~~ increases.**

p. 73

Circle One : True (False)

Falling downward = ↑ velocity

6. **Before performing a free fall calculation, why must a positive or negative coordinate system be identified?**

To keep all signs constant

(I will use up as positive)

7. **Which form of *g* is used when an object is accelerating?** (Don't confuse with direction.)

Downward acceleration is equal to upward direction!

Downward : a = -9.8 m/s^2

Upward : a = 9.8 m/s^2

I use opposite!

Name _____

8. **As an object is thrust into the air, the velocity ~~increases~~.** decreases

Circle One : True (False)

9. **An object thrown into the air has zero velocity when it reaches its highest point.**

Circle One : (True) False

Weightlessness in Space!

10. **What is the acceleration of an object at the top its flight?**

9.8 m/s²

(Must go somewhere!)

11. **What are three components of many amusement park rides (roller coasters)?**

1. The ride to the top.
2. Momentary suspension
3. The plunge downward.

12. **Circle the letter of the type of rider that would fall with greatest acceleration?**

a. A small rider
b. A large rider
c. Mr. Reuter
(d.) All objects fall with the same rate of acceleration.

13. **Which equation would be used to determine each of the following for free falling objects?**

Velocity at a given time

$v_f = v_i + \bar{a} t_f$

$\bar{a}$ = acceleration due to gravity (± 9.8 m/s²)

Time given a certain velocity

$t_f = \frac{v_f - v_i}{\bar{a}}$

Distance given velocity & time

$d_f = d_i + v_i t_f + \frac{1}{2} a t_f^2$

Velocity given distance

$v_f^2 = v_i^2 + 2\bar{a}(d_f - d_i)$