

Free Fall Day 3

Name: _____

$$d = v_i t + (0.5)at^2$$

$$v_f = v_i + at$$

$$\text{Free Fall: } a = -10 \text{ m/s}^2$$

1. If you drop from rest from a 10 m diving platform into the water...

- a) How long will you be in flight?
- b) How fast will you be going when you hit the water?

2. Galileo supposedly dropped a small round rock and a cannon ball from the Leaning Tower of Pisa. The tower is 56 meters tall.

- a) How long did the small ball take to hit?
- b) How long did it take the cannonball to hit?

3. Estimate the fastest speed something could have if dropped in this room. (Hint: this is a two-part problem.)

4. If a penny were dropped from the observation deck of the Empire State Building (369 m), and if it experienced no drag on the way down...

a) How much time would it take?

b) How fast would it be going when it reached the pavement?

c) Aren't you glad pennies experience a lot of air drag?

5. Rain falls from clouds that could be as high as 2,000 meters up. If rain experienced no drag on the way down...

a) How much time would it take to fall?

b) How fast would it be going when it reached the ground?

c) Aren't you glad rain drops experience a lot of air drag?

6. Felix Baumgartner broke Joe Kittinger's record on October 14, 2012 by falling from a height of 128,000 ft. He reached a top velocity of about -370 m/s.

Assuming he was in free fall...

a) How long did it take him to hit that velocity?

b) How far did he fall in that time?