Spring 2014

PHYS-2010

Lecture 7

Clicker Question

Room Frequency BA

If you **drop** an object in the absence of air resistance, it accelerates downward at 9.8 m/s^2.

If instead you **throw** it downward, its downward acceleration ***after release*** is….

A) less than 9.8 m/s^2.

B) 9.8 m/s^2

C) more than 9.8 m/s^2

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Announcements

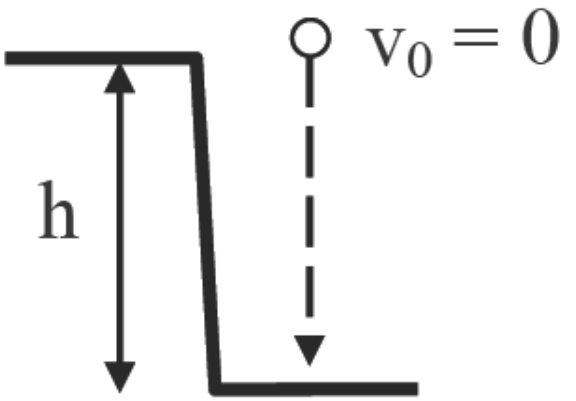
- Read Giancoli Sections 3.1-3.5.
- **CAPA assignment # 3** is due next Tuesday at 11 pm.
- **Written homework # 2** is due this Friday at 4 PM.
- My **Help Room hours** this week will be Thursday, 11-12.
- **Midterm Exam 1** will be Thursday, Feb 6, 7:30-9:15 PM.
- More details about the exam are on the next slide on the course website:

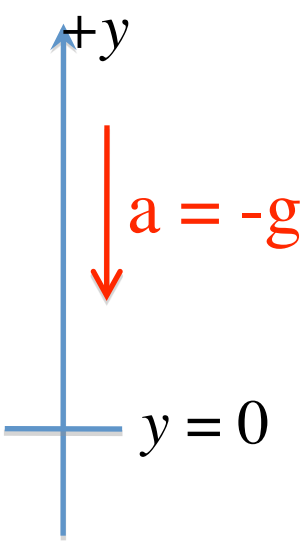
http://www.colorado.edu/physics/phys2010/phys2010_sp14/exams.html

Mid-Term Exam I

- Covers Giancoli Chapters 1 – 3.4, in-class Clicker Questions & Lectures 1-8, CAPA Sets 1-3, Written Homeworks 1-2, Recitations 1-3, and Lab 1.
- The exam is closed book and no notes allowed. There will be 20-25 multiple choice questions. Bring a #2 pencil for marking your answer on the scan sheet.
- Bring a scientific calculator which you know how to operate; apps on phones or other wireless devices are not allowed.
- You can bring 1-sided page (8.5x11) with your hand-written notes.
- Your exam room will be announced in Monday's lecture.
- An old **practice exam** will be posted on D2L.
- Students who need **special accommodations** to take the exam need to contact Prof. Pollock ASAP.

Consider a ball dropped from a hill of height *h*.





What is y_0 (initial position) and what is *a* (acceleration)?

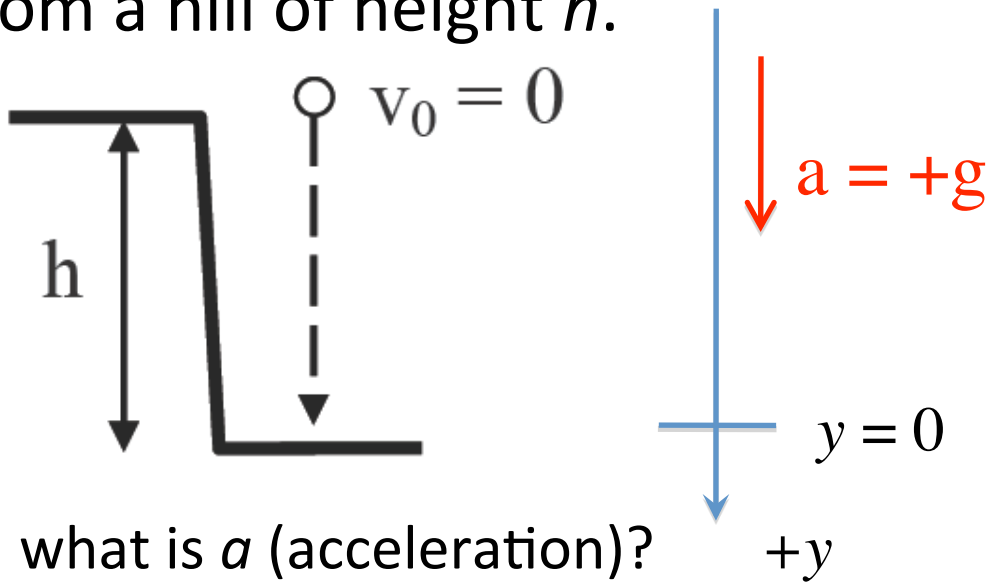
A) $y_0 = +h$, $a=-g$
B) $y_0 = -h$, $a=+g$
C) $y_0 = 0$, $a=+g$
D) $y_0 = -h$, $a=-g$
E) $y_0 = 0$, $a=-g$

Note: g = + 9.8 m/s^2 > 0

Clicker Question

Room Frequency BA

Consider a ball dropped from a hill of height *h*.



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Clicker Question

Room Frequency BA

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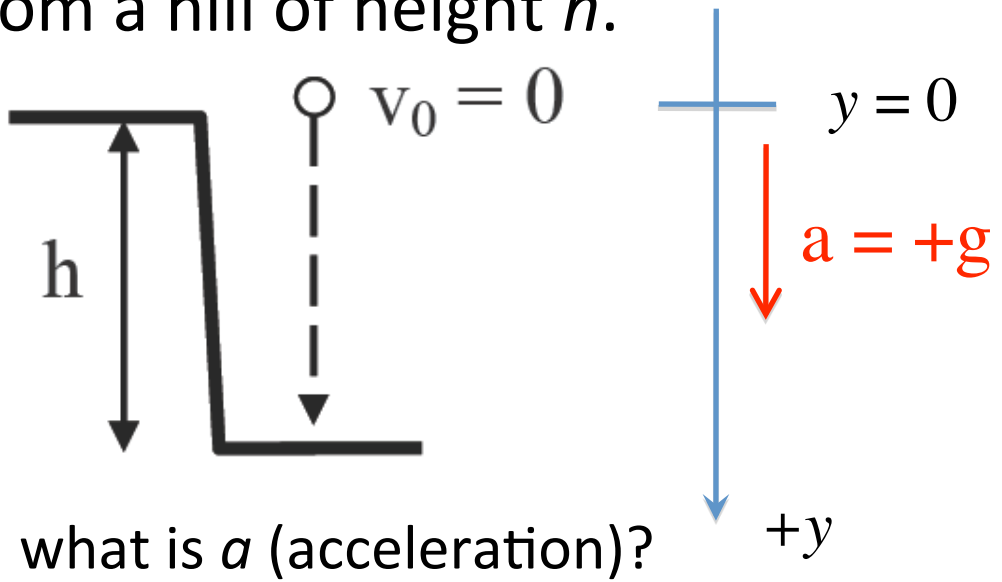


What is y_0 (initial position) and what is *a* (acceleration)?

A) $y_0 = +h$, $a = -g$
B) $y_0 = -h$, $a = +g$
C) $y_0 = 0$, $a = +g$
D) $y_0 = -h$, $a = -g$
E) $y_0 = 0$, $a = -g$

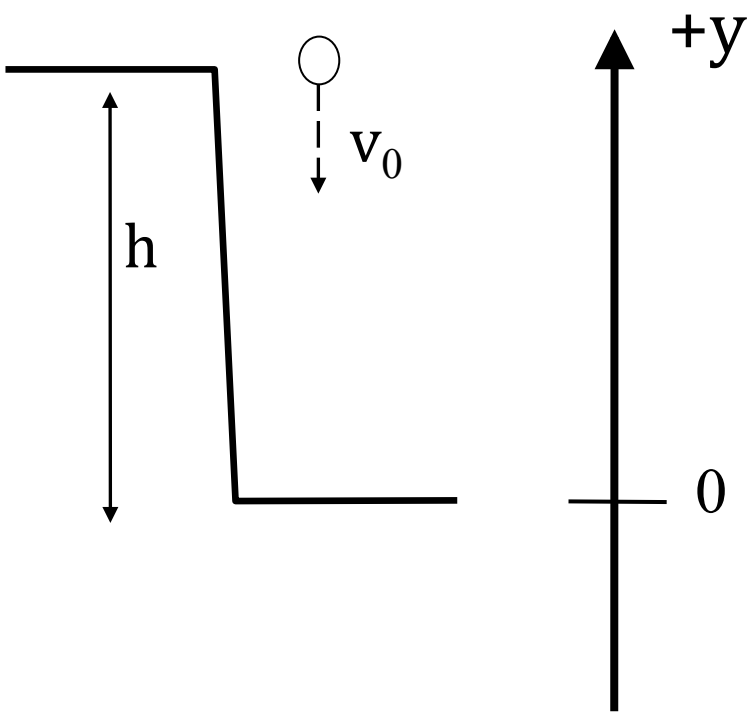
Note: g = + 9.8 m/s^2 > 0

Clicker Question

Room Frequency BA

A rock thrown straight down from an initial height h above the ground, with an initial SPEED v_0 . UP is chosen as the + direction.

What is the correct formula for the **velocity** in this case?



A) $v = v_0 + gt$

B) $v = - v_0 + gt$

C) $v = v_0 - gt$

D) $v = - v_0 - gt$

E) None of these

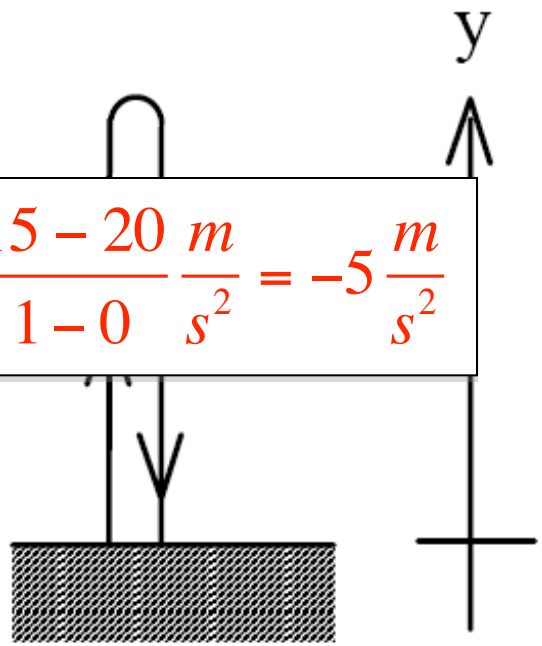
Clicker Question

Room Frequency BA

On planet X, a cannon ball is fired straight upward. The position and velocity of the ball are listed for many times in the table below.

Time(s)	Height(m)	Velocity(m/s)
0	0	20
1	17.5	15
2	30	10
3	37.5	5
4	40	0
5	37.5	-5
6	30	-10
7	17.5	-15
8	0	-20

$$a = \frac{\Delta v}{\Delta t} = \frac{15 - 20}{1 - 0}\frac{m}{s^2} = -5\frac{m}{s^2}$$



What is the acceleration due to gravity on Planet X?

A: $-5 m/s^2$

B: $-10 m/s^2$

C: $-15 m/s^2$

D: $-20 m/s^2$

E: None of these.

Clicker Question

Room Frequency BA

Consider a cannonball shot up into the air with initial velocity v_0. If its initial velocity is doubled, the time to reach the apex of its trajectory will…..

A) Double

B) Increase by a factor of 4

C) Increase by a factor of 9

D) Increase by the square root of 2

E) Impossible to tell from the information given.

Hint: Use the equation $v = v_0 + a\,t$.

$$0 = v_0 - gt_1 \quad \rightarrow \quad t_1 = \frac{v_0}{g}$$

$$0 = 2v_0 - gt_2 \quad \rightarrow \quad t_2 = \frac{2v_0}{g}$$

➔ $t_2 = 2t_1$

Clicker Question

Room Frequency BA

Consider a cannonball shot up into the air with initial velocity v_0. If its initial velocity is doubled, the maximum height of the ball will…..

A) Double

B) Increase by a factor of 4

C) Increase by a factor of 9

D) Increase by the square root of 2

E) Impossible to tell from the information given.

Hint: Use the equation $v^2 = v_0^2 + 2a\,(x\text{-}x_0)$.

$$0 = v_0^2 - 2gx_1 \quad \rightarrow \quad x_1 = \frac{v_0^2}{2g}$$

$$0 = (2v_0)^2 - 2gx_2 \quad \rightarrow \quad x_2 = \frac{4v_0^2}{2g}$$

➔ $x_2 = 4x_1$