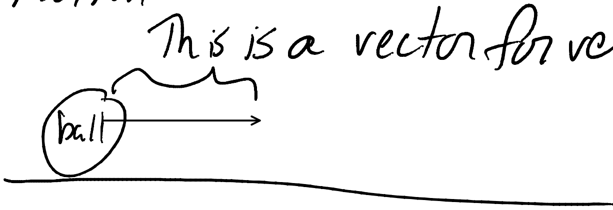
September-28-10
1:37 PM

uniform motion

- constant velocity
- constant acceleration

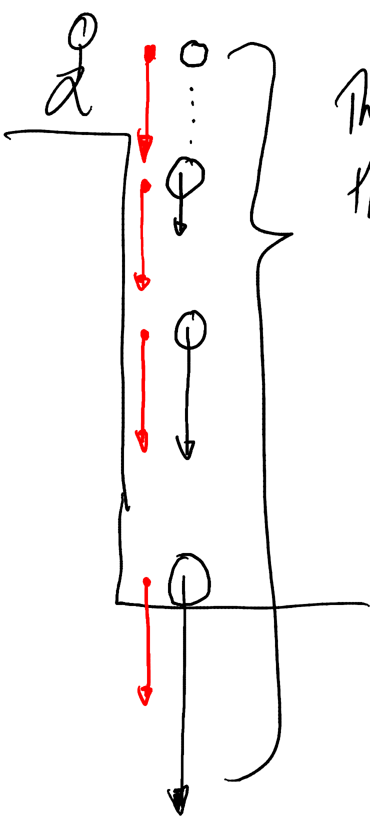
must have uniform motion in order to use
5 formulas

ex) how would we visually describe uniform
motion



This image describes a ball travelling @
constant velocity

ex)



The change in magnitude describes
the objects change in its speed
This is called acceleration
or gravitational constant

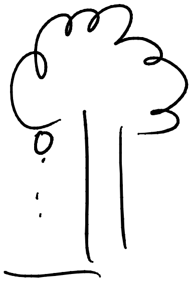
$$"\vec{g}" = -9.80\ \frac{m}{s^2}$$

This a special type of $\vec{a}$

$\vec{g}$ is drawn in red, the magnitude
never changes

ex) pg 69 #2

since we are interested in objects dropping we ONLY consider the vertical axis



$g = -9.80\, m/s^2$ {understood}

$t = 0.50\, s$

$V_{iy} = V_{yi} = 0$ {understood}

$d_y = ?$

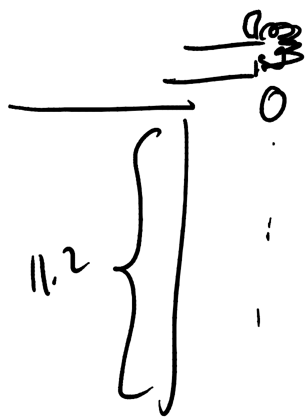
$$d_y = V_{yi}t + \frac{1}{2}gt^2$$

$$= \left(0\frac{m}{s}\right)(0.50\,s) + \frac{1}{2}\left(-9.80\frac{m}{s^2}\right)(0.50\,s)^2$$

$$\boxed{= -1.2\, m}$$

↑ downward, displacement is ⊝ive

ex 6)



$t = .550\, s$

$d_y = -11.2\, m$

$g = -9.80\, \frac{m}{s^2}$

$V_{yi} = ?$

} 1

$$d_y = V_i t + \frac{1}{2}gt^2$$

$$V_i = \frac{d_y - \frac{1}{2}gt^2}{}$$

} 1

?

$$V_i = \frac{-11.2m - \frac{1}{2}(-9.80\frac{m}{s^2})(.550s)^2}{(.550s)}$$

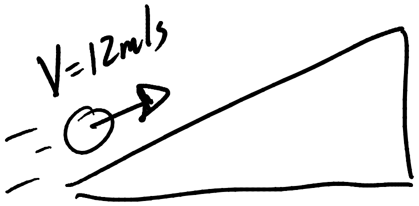
$$= -17.7\frac{m}{s}$$

Pg 69 # 1-21 odd

Skip lesson 6 for now jump to 7

- rolling up, down inclines

ex) a ball is rolled up a constant slope with an initial velocity of 12.0m/s, if the ball's disp is 0.500m up the slope after 3.60s, what is the velocity of the ball @ this time



disp 99.9% of the time

$d = 0.500\,m$

$t = 3.60$

$V_f = ?$

$V_i = 12.0\,m/s$

1 mark

$$2\frac{d}{t} = \left(\frac{V_i + V_f}{2}\right)\frac{t}{t} \cdot 2$$

1 mark

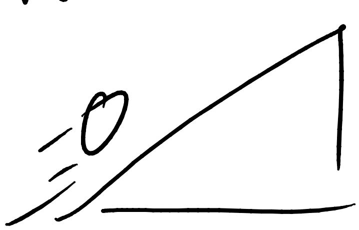
$$V_i + V_f = \frac{2d}{t} - V_i$$

$-V_i$

$$V_f = \frac{2(.500\,m)}{3.60\,s} - 12.0\,m/s$$

$$= \boxed{-11.7\,m/s}$$

#2 pg 99



$V_i = 9.3\,m/s$

$d = 1.9$

$t = 2.7\,s$

$a = ?$

1 mark

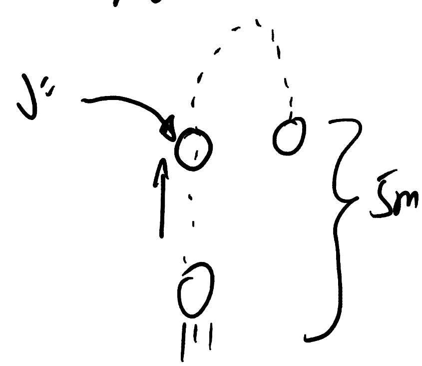
$d = V_i t + \frac{1}{2} a t^2$

$\frac{2(d - V_i t)}{t^2} = \frac{\cancel{2} \cdot \cancel{\frac{1}{2}} a t^2}{t^2} \qquad a = \frac{2(d - V_i t)}{t^2}$ } 1 mark

$a = \frac{2(1.9\,m - 9.3\,\frac{m}{s} \cdot 2.7\,s)}{(2.7\,s)^2}$ } 1 mark

$= \boxed{-6.4\,\frac{m}{s^2}}$

#8 pg 101



$g = -9.80\,\frac{m}{s^2}$

$V_i = 10.0\,\frac{m}{s}$

$d_y = 5.0\,m$

$V_f =$

} 1 mark

$V_f^2 = V_i^2 + 2gd$

$V_f = \pm\sqrt{V_i^2 + 2gd}$ } 1 mark

$= \pm\sqrt{(10\,m/s)^2 + 2(-9.80\,\frac{m}{s^2})(5.0\,m)}$

$= \pm 1.4 \frac{m}{s}$

$= -1.4$ m/s since it's on its way down

$v = 1.4 \frac{m}{s}$ down

Try pg 99-105 odd

HW H/O # 8, 9, 10, 11
due next class