Physics Assignments, 2012

	Concept	Reading	Page	Rev Con	App Con	Problems
A1	What is science/physics	Ch 1 p 3-10	11	1,2	4,6,8	
A2	Measurement	p 13 - 20	35	3,4	1(a,b)	1, 2,b,e,f 3,4
	Scientific notation					21,27,24,26
A2.5	Handout on re-arranging formulas					
A3	Uncertainty	p21-31	35	5,7,8,11,12	5,7,8	5,6,8,9bd,10,
						17,18,19
A4	Rearranging formulas	p.31-32	33	do practice problems 19 - 22		
A5	more rearranging eq's	ch2	39			20-22, 24-28
M1	start mechanics unit	p.41-57	57	1,2,4,6	3,4,6,7	1,2,4,6,9
				7, 10	8,	
M2	velocity, probs	p.41-57	57		9,10,11	10,14,16,24,25
						24,25
M2.5	Watch the dull and borinig physics videotape (WCRR) and start the handout					
	WCRR handout prob 1					
	WCRR handout probs 2 and 3					
M3	Acceleration (ch 4)	63-80	81	1,2,3,4,6	3,4,7	1,3,2
M4	acceleration	63-80	81	9,10		10,11,12,14,15
						16, 18, 25
M5		63-80	81			20,23,24,26
						31,37

Aug, 2012

A note about solutions:

Some of the following show work & are thus a solution, in others only an answer is shown. Generally as I wrote these out, I was in a hurry, so scribbled, & made the occasional error. Life is like that.

PHYSICS A1

Read ch. 1. p. 3-10

P. 11

RC. 1, 2, ~~3~~

AC. 4, 6, 8.

R.C

(2.) Math is the language of physics. We use mathematics to help us understand the relationships in physics.

~~(3.) Experimental~~

(1.) the study of how the universe works.

AC.

(4.) motion → roller coaster

properties of materials → bullet proof vest

sound → decibel level meter.

light → lasers to read CD's.

electricity → power to run air conditioning

magnetism → Mag-lev trains.

(6.) no. its a lot of steps that can be listed in order, but that may really happen out of order, or, several at the same time.

(8.) experimental results are published & the experiments can be repeated by others.

Pt val			
R.C	1	-	2
	2	-	2
	3	-	~~2~~
	4	-	6
	6	-	2
	8	-	2 (14)

Σ = ~~14~~ (14)

RC.

(1) 3. derived units are composed of various combinations of fundamental units multiplied or divided

(1) 4. (a.) cm (b) mm (c) Km

AC.

(V) 1. (a) $\frac{g}{cm^3}$ (b.) derived (c) $\frac{Kg}{m^3}$

P.

(4) 1. (a) $5 \cdot 10^{24}$ m

(b.) $1.66 \cdot 10^{-19}$ m

(c.) $2.033 \cdot 10^{9}$ m

(d.) $1.030 \cdot 10^{-7}$ m

(3) 2. (b) $6.2 \cdot 10^{-12}$ m

(e) $2.14 \cdot 10^{-4}$ m

(f.) $5.70 \cdot 10^{-7}$ m

(3) (3.) 0.31mg, 102µg, 0.000 006kg, 11.6mg

(4) (4.) (a) $6.12 \cdot 10^{9}$ s

(b) $2.94 \cdot 10^{-6}$ m

(c) $1.250 \cdot 10^{-4}$ kg

(d) $7.50 \cdot 10^{7}$ J

PHYSICS
A2
Read p. 13-20

P.35 RC 3, 4
AC 1, ab
P 1, 2 be f, 3, 4

21, 27
24, 26

21 - 1
27 - 2
24 - 2

26 - 3

PT. VAL

RC.	3	1
	4	1
AC	1	2
P	1	4
	2	3
3 - 1	3	3
	4	(4)

$\sum$ = (15) (17)

(21) (23)

Physics
A2
Second half.
p 37, 21, 27, 24, 26

(2) 21. $T = 2\pi\sqrt{\frac{l}{g}}$

(a.) $\frac{T^2 g}{4\pi^2} = l$

(b.) $g = \frac{4\pi^2 l}{T^2}$

(2) 27. (a) $\frac{20\ km}{hr} \cdot \frac{1\ hr}{60\ min} \cdot 1.5\ min = 0.5\ km$ (b.) $\frac{12\ min}{0.2\ hrs}$

(2) 24. (a) $v = \frac{2\pi r}{T} = \frac{2\pi \cdot 1.5 \cdot 10^8\ km}{1\ yr} \left| \frac{1\ yr}{365\ D} \right| \frac{1\ D}{24\ hr} = 107,600 \frac{km}{hr}$

(b.) $\frac{107588.8\ km}{hr} \left| \frac{1000\ m}{1\ km} \right| \frac{1\ hr}{3600\ sec} = 29,900 \frac{m}{s}$

(2) 26. 10 min = 24 rev
600 sec = 24 rev
25 sec = 1 rev

$v = \frac{2\pi r}{T}$

$v = \frac{2\pi \cdot 5.4\ m}{25\ sec}$

$v = 1.36 \frac{m}{sec}$

$\Sigma = 8$ pts / assignment

A 2.5

Physics

Formulas. Solve for the indicated variable.

1. $a_c = \frac{v^2}{r}$ (for r) → $r = \frac{v^2}{a_c}$

2. $qV = \frac{1}{4\pi\varepsilon_o} \cdot \frac{q_1 \cdot q_2}{r}$ (for ε_o) → $qV = \frac{1}{4\pi\epsilon_0} \cdot \frac{q_1 q_2}{r}$; $\epsilon_0 = \frac{q_1 q_2}{4\pi r V}$

3. $W = F \cdot s \cdot \cos\theta$ (for s) $s = \frac{W}{F\cos\theta}$

4. $v = \sqrt{\frac{3k_BT}{\mu}}$ (for μ) → $v^2 = \frac{3k_BT}{\mu}$ → $\mu = \frac{3k_BT}{v^2}$

5. $E = mc^2$ either $m = \frac{E}{c^2}$ or $c = \sqrt{\frac{E}{m}}$

6. $pV = nRT$ (for R) $R = \frac{pV}{nT}$

7. $E = hf$ (for f) $f = \frac{E}{h}$

8. $\frac{h_i}{h_o} = \frac{d_i}{d_o}$ (for d_o) $d_o = \frac{h_o d_i}{h_i}$

PHYSICS A3 KEY

P. 35.
R.C. 5, 7, 8, 11, 12,
A.C. 5, 7, 8
P. 5, 6, 8, 9 b d, 10, 17, 18, 19

R.C.

5. THE PRECISION OF A MEASUREMENT IS DETERMINED BY THE PRECISION OF THE MEASURING INSTRUMENT: HOW FINELY DIVIDED IS THE SCALE ON THE INSTRUMENT BEING USED.

7. THE LAST DIGIT RECORDED IS THE FIRST DIGIT NOT KNOWN WITH CERTAINTY.

8. THE ZEROS AREN'T SIGNIFICANT, BUT MAYBE IN RICK'S MEASUREMENT THEY SHOULD BE, ~~KESA~~, IF SO, HE COULD RECORD THE NUMBER IN SCIENTIFIC NOTATION, like, 7.6 nm or 7.60 nm, or 7.600 nm, or 7.6000 nm TO INDICATE 2, 3, 4, or 5 sig. digs, respectively.

11. Ind → TEMP Dep → vol.

12. X → TEMP Y → VOL

Point Value
Every numbered Q or P is 1 pt., except P 17, 18, 19 are 2 pts total = 19 points

A.C. 5. THIS IS CONFUSING, since for the 3 measurements,

84 cm ← not enough precision, we should be able to get 84.00 cm (certain / uncertain)

83.8 no units, not enough precision

83.78 no units, precision ok.

so, any answer, as long as you give a reasonable explanation.

7. From algebra, we know that only like terms can be added or subtracted, in physics we have to consider the units, if the units are different, the terms are not like terms, but in algebra any 2 terms can be multiplied or divided.

8. negative  y decreases as x increases, so $m = \frac{\Delta y}{\Delta x} = \frac{-}{+} = \ominus$

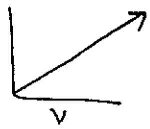
P. 5. a. 3 b. 1 c. 4 d 5

6. a 3 b. 1 c. 3

8. a. 34.7 m
b. 25.022 m
c. 46.00 cm^2
d. 3.1 kg.

9. ~~a. $2.7 \cdot 10^9 \frac{m}{?}$~~
b. $2.0 \cdot 10^5 \frac{m}{s}$
~~c. $1.3 \cdot 10^{-6}$ Km~~
d. 190 $\frac{kg}{m}$ or $1.9 \cdot 10^2 \frac{kg}{m}$

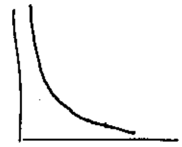
10. (a) 7.4 mm (b) 49.6 m^2 (c) 70.4 kg
49.6 m^2

(17) (a) 

(b.) Line
(c.) $M = m \cdot V$
other letters are ok
(d.) $\frac{g}{cm^3}$, density

(18) (a) 

(b.) as Force increases the acceleration increases.
(c.) $a = k \cdot F$ other letters ok.
(d.) $\frac{\frac{M}{s^2}}{N}$ or $\frac{M \cdot N}{s^2}$ or $\frac{1}{Kg}$

(19) (a) 

(b.) inverse relation, or hyperbola
(c.) as one quantity gets larger, the other gets smaller.
(d.) $a = \frac{k}{M}$ or $a \cdot M = 1$ or $a \cdot M = 12$ (different letters ok)
e. $\frac{Kg \cdot M}{s^2}$

T. vals

A4. Physics

p. 33 19-22

(19.) (a.) $\frac{d}{t} = v$

(1) (b.) $v = \frac{d}{t}$

(1) (c.) $\sqrt{2ad} = v$

(1) (d.) $v = \frac{ab}{c}$

(1) (20.) (a) $E = F \cdot s$

(1) (b.) $m = \frac{2E}{v^2}$

$\frac{mv^2}{2} = E$

(1) (c.) $E = mc^2$

(21.) $V^2 = V_0^2 + 2ad$

(1.) $\frac{V^2 - V_0^2}{2a} = d$

(1) (22.) (a) $\frac{V - V_0}{t} = a$

(1.) (b) $\frac{2(y - V_0 t)}{t^2} = a$

(1.) (c) $\frac{V^2 - V_0^2}{2y} = a$

(1.) (d) $\frac{V^2}{2s} = a$

$\Sigma = 12$

Physics A5

Ch. 2 ← READ

p. 39. 20–22
24–28

(20.) (a) $(4.23\,cm)^3 = 75.7\,cm^3$

(b.) $75.7\,cm^3 \cdot \frac{19.3\,g}{1\,cm^3} = 1460\,g$

(21.) $T = 2\pi\sqrt{\frac{l}{g}}$

$\frac{T^2}{4\pi^2} = \frac{l}{g}$

$T^2 g = 4\pi^2 l$

$g = \frac{4\pi^2 l}{T^2}$ or $l = \frac{T^2 g}{4\pi^2}$

(22.) (a) $65.0\,cm^3 \cdot \frac{10.5\,g}{1\,cm^3} = 682.5\,g$

(b.) $682.5\,g - 616\,g = 66.5\,g$

$66.5\,g \cdot \frac{1\,cm^3}{10.5\,g} = 6.3\,cm^3$

(24.) $V = \frac{2\pi r}{T}$

$= \frac{2\pi \cdot 1.5 \cdot 10^8\,km}{365 \cdot 24\,hr}$

$= 1.076 \cdot 10^5\,\frac{km}{hr}$

$= 2.99 \cdot 10^4\,\frac{m}{s}$

(25.) $V = \frac{2\pi r}{T} = \frac{2\pi \cdot 6370\,km}{24\,hrs.}$

$= 1668\,\frac{km}{hr}$

$= 463\,\frac{m}{s}$

(26.) $1.4\,\frac{m}{s}$

(27.) 0.5 km

12 min

(28.) $3600\,sec \cdot \frac{2\,drops}{3\,sec} \cdot \frac{1\,cm^3}{20\,drop} \cdot \frac{1\,dm^3}{1000\,cm^3}$

$= 0.12\,dm^3$

Pt. val

8 probs @ 2 pts each

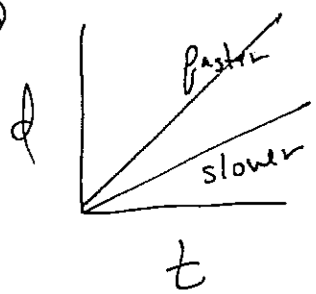
= 16 pts

M-1

Physics [redacted] p.57
R.C. 1,2,4,6,7,10
A.C. 3,4,6,7,8,9
P. 1,2,4,6,9

Read p 41–57

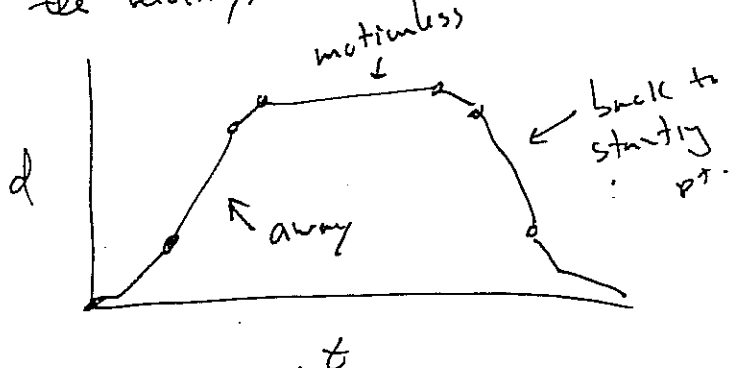
I. (1) any reasonable answer
(2) scalar have magnitude only
vectors have magnitude + direction
(4) vector
(6) (a.) Yes } velocity includes direction.
(b.) No }
(7)



← faster motion has a steeper d/t graph.

(10.) v increased with t, we also can see where the shifts occur.

II. (3) same
(4.) $\frac{\Delta t}{\Delta d}$ is large at low v, small at high v
we can't have $d \neq 0$ when $t = 0$.
$\frac{\Delta t}{\Delta d} \neq 0$ since
(6) (a) motion at constant velocity.
(b.) the velocity.
(7)



steeper slopes are motion at greater velocity.

All probs @ 1pt each
Point Value = 16 pts.

(8) A gets a head start.
B is faster.
At point P B overtakes A.

P. 1 (a) 45 2, −85 mi 4. $1.5 \cdot 10^{11}$ m 6,
b 115
9, (a) 14 Km/h west
(b.) no

Length of event (m)	Speed (m/s)	
	Men	Women
100	10.142	9.533
200	10.142	9.372
400	9.240	8.393
800	7.864	7.062
1500	7.1818	6.4524
3000	6.6821	5.9687
5000	6.4235	~~5.0991~~ 5.197
10000	6.1416	5.5135

M-2 Physics
Ch. 3
p 57-61
AC. (9)(10)(11)
P. (10)(14)(16)(24) 25

(9.)
a. 1.5 sec + 8.5 sec
b. A
c. ≈ 3.5 sec
d. nowhere
e. the entire graph.

(10.)
(a.) constant velocity.
(b.) displacement

(11.)
(a.) increasing velocity
(b.) displacement.

(P.) (10.) $\frac{55 \text{ km}}{\text{hr}} \left| \frac{1000 \text{ m}}{1 \text{ km}} \right| \frac{1 \text{ hr}}{3600 \text{ sec}} = 15.27 \frac{m}{s}$

Ans → 0.75 sec

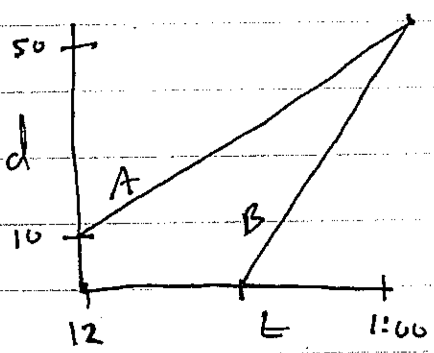
$D = RT$

$D = \frac{15.27 \text{ m}}{\text{sec}} \cdot 0.75 \text{ sec}$

$D = 11.46 \text{ m}$

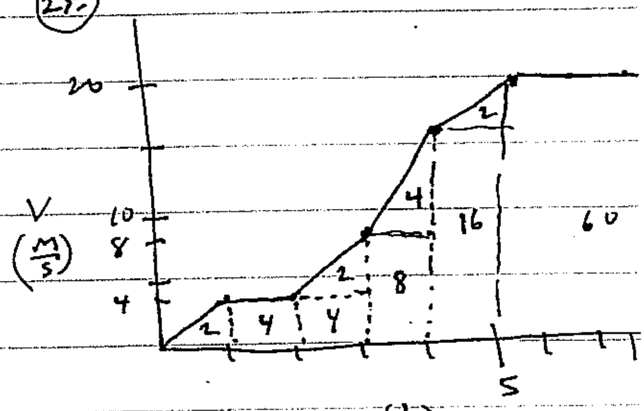
(14.)
(a.) 400 m
(b.) 0 m
(c.) −200 m
200 m back toward the start.

(1.)



(24.)
(a.) 75 m
(b.) 150 m
(c.) 125 m
(d.) 500 m

(25.)



(a.) ↗
(b.) 6 m
(c.) 12 m
(d.) 162 m

Pt. Value

~~test~~ =
AC 3@2 each = 6
Probs 5@2 each = 10
Σ = 16

A2.5

WILEY AND ROADRUNNER: ACME Rocket-Cycle

Wiley Coyote has a running speed of 15 m/sec; the Roadrunner zips along at 75 m/sec. Wiley has ordered from Acme a hydraulic Rocket-Cycle, a sure-fire Roadrunner catcher. With this device, Wiley lies in wait behind a boulder, cycle primed and ready to go, waiting for the Roadrunner to appear. The new cycle will blast along at 120 m/sec, but only for 5 seconds before it has to reprimed, a process which takes Wiley 9 second.

At last, Wiley spots the Roadrunner 300 m off, moving away; he fires off the Rocket-Cycle and the pursuit is on.

Plot a position vs time graph for the chase to show when and where Wiley Coyote catches the Roadrunner .....(?!?).......OR.....the distance of closest approach if he fails.

WILEY AND THE ROADRUNNER : JET Powered ATV

Wiley Coyote, in another new scheme to catch the Roadrunner (tastilus morselus), has a jet powered ATV that rockets instantaneously to a constant speed of 24 m/sec when triggered. The Roadrunner, starting from rest, can uniformly accelerate at 8 m/sec^2. If the roadrunner is stopped 25 m away from Wiley's hiding place and both take off when the ATV starts, will Wiley have a snack?

Plot both motions on a position vs time graph. Clearly show on your graph the time and position when *either* Wiley catches the roadrunner *or* the time and distance of closest approach if Wiley goes hungry again.

WILEY "TRAINS" THE ROADRUNNER

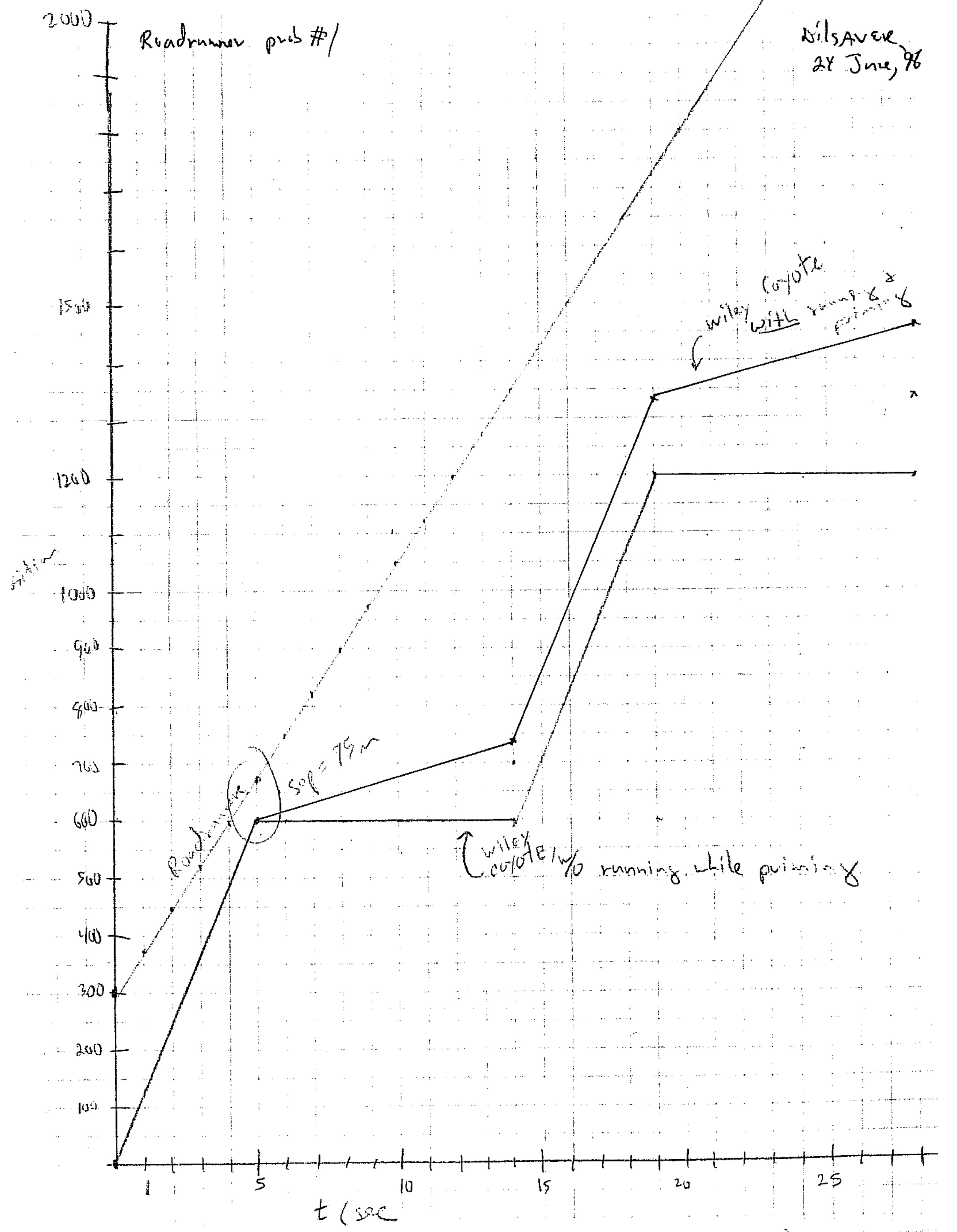
Wiley Coyote is in hot pursuit of the roadrunner (sprintimus maximus), but this time, they are both on trains. Wiley espied the roadrunner boarding a slow train at the station and hopped the next express train going the same way.

The roadrunner's train has a speed of 30 ft/sec and Wiley's has a speed of 100 ft/sec. Wiley's train is catching up fast. The track starts to climb a steep incline. The distance between the two trains is getting smaller and smaller.

In anticipation, Wiley climbs out onto the front of the engine of his train, the better to see, and to be ready to hop aboard the other train.

But when the distance between the two trains is only 600 ft, the caboose of the roadrunner's train *mysteriously* comes loose and starts to decelerate at 6 ft/sec^2. The engineer of Wiley's train immediately applies the brakes, causing a deceleration of 10 ft/sec^2.

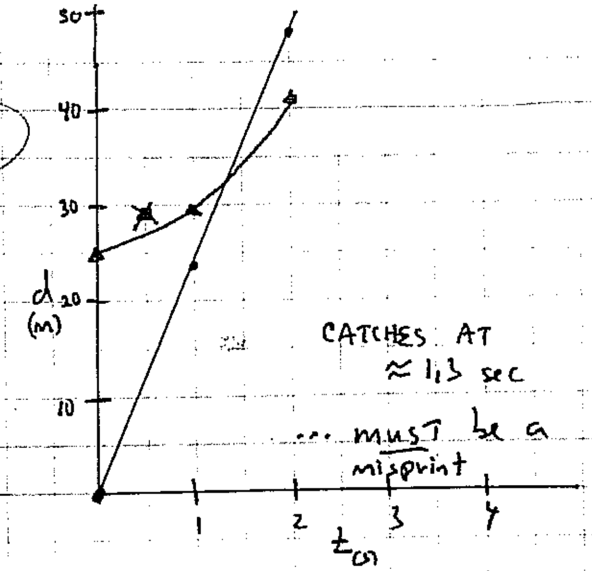
Describe what happens to Wiley.



Roadrunner prob #1
Dilsaver
24 June, 96
2000
1500
1200
1000
900
800
700
600
500
400
300
200
100
5
10
15
20
25
t (sec
Roadrunner
5 sec = 75 m
wiley coyote with running & priming
wiley coyote w/o running while priming

WILEY + the RoadRunner
JET POWERED ATV

Version #1



t (s)	d_{RR} (m)	d_{WC} (m)
0	25	0
1	29	24
2	41	48

MATHEMATICALLY: Separation = RR − WC

or $sep = \left(25 + 0 \cdot t + \frac{1}{2} \cdot 8 \frac{m}{s^2} \cdot t^2\right) - (24t)$

$= 25 + 4t^2 - 24t$

$d = 4t^2 - 24t + 25$

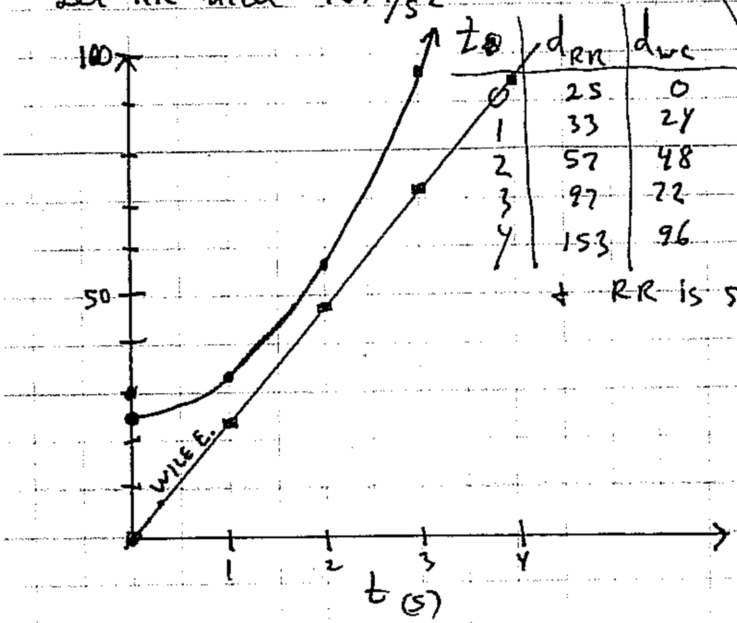
Now, let $d = 0$ + solve the 2nd degree equation

possible methods:
- Guess + Check
- Complete the square
- factor (HA!!)
- Quad formula
- graph + ZOOM on TI-82
- QUAD PROG. on TI-82

I chose the QUAD prog. on TI-82 + at $t = 1.34$ sec the distance is 0

Version #2

Let RR accel = $16\ m/s^2$

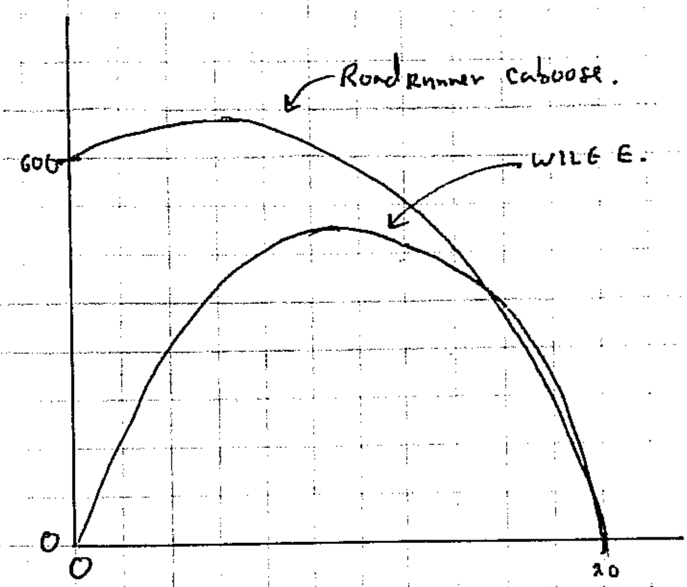


t	d_{RR}	d_{WC}
0	25	0
1	33	24
2	57	48
3	97	72
4	153	96

+ RR is SAFE!!!

By graphing calc. the closest approach is at $t = 1.5$ sec (due to symmetry) + is 7.0 m

Wiley "Trains" the R.R. #3



FACTS

Wile E.	RR. (caboose)
$V_0 = 100 \text{ ft/s}$	$V_0 = 30 \text{ ft/s}$
$a = -10 \text{ ft/s}^2$	$a = -6 \text{ ft/s}^2$

separation = Position RR_{cab} − Pos. W.E.

use $S = S_0 + V_0 t + \frac{1}{2} a t^2$ for both

after 15 sec., caboose collides with Wile E., + wrecks his dinner plans (frustrations lunchins)

FACTS at 15 sec

	RR_{cab}	W.E.
position	375 m	375 m
V	−60 ft/s	−50 ft/s

both are moving downhill, the caboose is 10 ft/s faster than W.E.

D

M-3 PHYSICS

Read p. 64-72

p. 81 RC 1, 2, 3, 4, 6,

AC 3, 4, 7

P. 1, 3, 2

RC

1 (1.) a. Y b. Y

1 (2.) Yes. drop an object

1 (3.) acceleration.

1 (4.) a = 0

1 (6.) $V_F^2 = V_I^2 + 2ad$

A.C.

1 (3.) $\frac{V_F - V_I}{t} = a$

3 (4.) (a.) curve = parabola

(b.) $\frac{\Delta P}{\Delta t}$ = velocity

(c) greater

2 (7.) (a) smaller.

(b) more

2 (2.) (a) $V_I = 0$, $V_F = 444 \frac{m}{s}$, $t = 1.80 \text{ sec}$

$\frac{V_F - V_I}{t} = a$

$\frac{444 - 0}{1.8} = a$

$247 \frac{m}{s^2} = a$

This is ≈ 25 "g"s

(b.) $V_I = 444 \frac{m}{s}$, $V_F = 0$, $t = 2.15 s$

$\frac{V_F - V_I}{t} = a$

$\frac{0 - 444 \frac{m}{s}}{2.15 s} = a$

$-207 \frac{m}{s^2} = a$

this is ≈ -21 "g"s

P.

2 (1.) a =

$V_I = 32 \frac{m}{s}$

$V_F = 96 \frac{m}{s}$

$t = 8 s$

$\frac{V_F - V_I}{t} = a$

$\frac{96 - 32}{8} = a$

$8 \frac{m}{s^2} = a$

4 (3.) (a) $\frac{V_F - V_I}{t} = a$

$\frac{30 - 0}{5} = a$

$6 \frac{m}{s^2} = a$

(b.) $a = 0 \frac{m}{s^2}$

(c) $\frac{V_F - V_I}{t} = a$

$\frac{20 - 30}{5} = a$

$-2 \frac{m}{s^2} = a$

(d.) $\frac{V_F - V_I}{t} = a$

$\frac{0 - 20 \frac{m}{s}}{5 s} = a$

$a = -4 \frac{m}{s^2}$

Pt. VAL

RC	1	1
	2	1
	3	1
	4	1
	6	1
AC	3	1
	4	3
	7	2
P.	1	2
	3	4
	2	2

$\Sigma = 19$

PHYSICS **M-4**

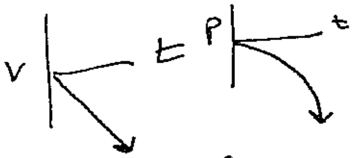
P. 81.
RC. 9, 10
AC.
P. 10, 11, 12, 14, 15, 16, 18, 25,

RC. 9. Feather, confetti, dust
10. shot putt,

AC. ~~8~~.
P. 10. ≈ 920m
11. ≈ 1700m
12. a. 43m
b. 43m

14. ≈ 1.2 sec

15.



c. $-20\frac{m}{s}$ $-39\frac{m}{s}$, yes

d. straight line

e. $-4.9\frac{m}{s^2} = \frac{1}{2}g$

f. yes.

16. $71\frac{m}{s}$

18. (a.) 24 s
(b.) ~~z~~ ≈ 740m

25. (a) hits
(b.) $22\frac{m}{s}$

Pt. val.

RC 9 - 1
10 - 1
P 10 - 1
11 - 1.
12 - 2.
14 - 2.
15 - 4.
16 - 2.
18 - 2.
25 - 2.

Σ = 18 pts.

PHYSICS p 81

M-5

Probs (20) (23) (24) (26) (31) (37)

(20.) $d = 0.02\,m$

$V_F = 3.5\,\frac{km}{s} = 3{,}500\,\frac{m}{s}$

(a.) $V_F^2 = V_I^2 + 2ad$

$\frac{V_F^2}{2d} = a$

$\frac{(3500\,\frac{m}{s})^2}{2 \cdot 0.02\,m} = a = 3.1 \cdot 10^8\,\frac{m}{s^2}$

(b.) $a = \frac{\Delta V}{\Delta t}$

$\Delta t = \frac{\Delta V}{a} \rightarrow \frac{3500\,\frac{m}{s}}{3.1 \cdot 10^8\,\frac{m}{s^2}}$

$\Delta t = 1.14 \cdot 10^{-5}\,s$

(23.) $V_F = 44\,\frac{m}{s}$

$d = 3.5\,m$

$\frac{V_F^2}{2d} = a$

$\frac{(44\,\frac{m}{s})^2}{7.0\,m} = a$

$276.6\,\frac{m}{s^2} = a$

$\div g \Rightarrow$ ball "feels" 28.2 "g's"

(24) $V_F = 600\,\frac{m}{s}$

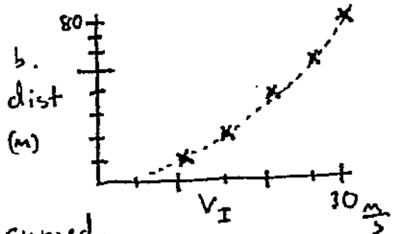
$d = 0.9\,m$

$\frac{V_F^2}{2d} = a$

$\frac{(600\,\frac{m}{s})^2}{2 \cdot 0.9\,m} = a$

$2 \times 10^5\,\frac{m}{s^2}$

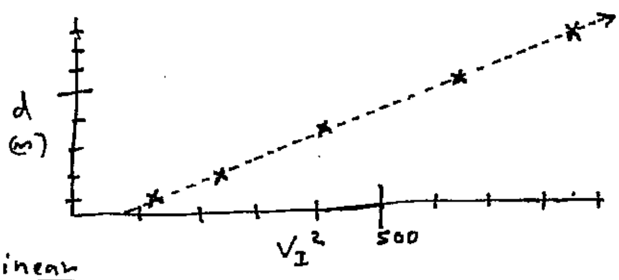
(26)



(a.) curved, possible parabola

(b.)

V_I^2	b. d
121	10
225	20
400	34
625	50
841	70



linear

c. slope $= \frac{(50-20)\,m}{(625-225)\,\frac{m^2}{s^2}} = 0.075\,\frac{s^2}{m}$

reciprocal $= 13.3\,\frac{m}{s^2}$

d.

(31.) $a = 9.8\,\frac{m}{s^2}$

$d = 12.0\,m$

$V_I = 0$

$V_F^2 = V_I^2 + 2ad$

$V_F = \sqrt{2 \cdot 9.8\,\frac{m}{s^2} \cdot 12.0\,m}$

$V_F = 15.4\,\frac{m}{s}$

(37.) (a) $-1.20\,m = d$ up + dn −

$g = a = -9.8\,\frac{m}{s^2}$

$V_F^2 = V_I^2 + 2ad$

$V_F = \sqrt{V_I^2 + 2ad}$

$= \sqrt{0 + 2 \cdot -9.8\,\frac{m}{s^2}(-1.20\,m)}$

$= -4.85\,\frac{m}{s}$ (downward)

(b.) ~~$V_I =$~~

$V_F = 0$

$V_F^2 = V_I^2 + 2ad$

$\sqrt{V_F^2 - 2ad} = V_I$

$\sqrt{0 - 2(-9.8\,\frac{m}{s^2})(1.00\,m)} = V_I$

$4.43\,\frac{m}{s}$ (upward) $= V_I$

(d) $a = \frac{\Delta V}{\Delta t} = \frac{V_F - V_I}{\Delta t}$

$= \frac{4.43\,\frac{m}{s} - -4.85\,\frac{m}{s}}{0.010\,sec}$

$= 928\,\frac{m}{s^2} \approx 94.7$ "g"'s

Pt. value

1 – State given info

1 – State + rearrange eq.

1 – Solving for the ans.

20	(a)	3
	(b.)	3
23		3
24		3
26	(a)	1
	(b.)	2
	(c.)	2
	(d)	2
31		3
37	(a)	3
	(b)	3
	(c)	3
		$\Sigma = 31$

d. pick any point on the curve, say, (70, 841)

use $V_I^2 = -2ad$

so, $841 = -2 \cdot a \cdot 70$

$6\,\frac{m}{s^2} = a$

so, yes