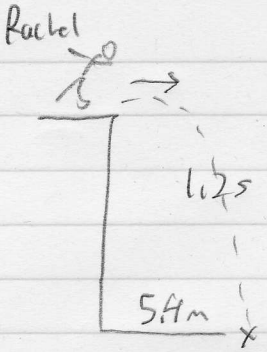
#1



H		V	
s	5.4	s	-7.0632
u	4.5	u	0
v	4.5	v	-11.772
a	0	a	-9.81
t	1.2	t	1.2

a) $7.0632 \approx$ **7.1 m**

$u, v = \frac{5.4}{1.2} = 4.5 \frac{m}{s}$

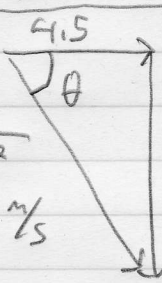
$V = u + at$

$= 0 + (-9.81)(1.2) = -11.772$

b) **4.5 m/s**

c) **4.5 m/s $\hat{x}$ + -12 m/s $\hat{y}$**

d)



$s = ut + \frac{1}{2}at^2 = \frac{1}{2}(-9.81)(1.2)^2$

$= -7.0632$

$\sqrt{4.5^2 + 11.772^2}$

$= 12.6 \frac{m}{s}$

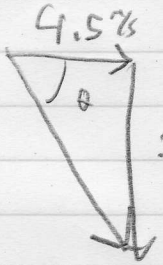
$\theta = \tan^{-1}\left(\frac{11.772}{4.5}\right) = 69.1°$

So **13 m/s 69° Below Horiz**

e)

H		V	
s	3.6m	s	-3.1392
u	4.5	u	0
v	4.5	v	-7.848
a	0	a	-9.81
t	.80	t	.80

@ .805



$\theta = \tan^{-1}\left(\frac{7.848}{4.5}\right)$ 60.17°

$\sqrt{4.5^2 + 7.848^2} = 9.0466 \frac{m}{s}$

9.0 m/s 60.° Below Horiz

$s = ut$

$(4.5)(.80)$

$= 3.6m$

$V = u + at$

$0 + (-9.81)(.8)$

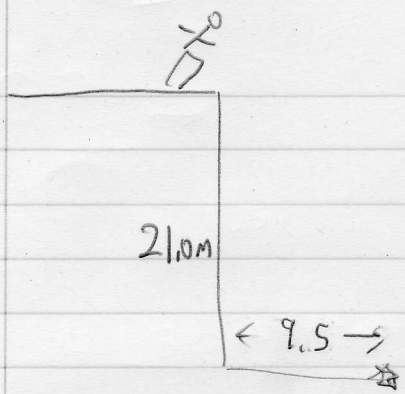
$s = ut + \frac{1}{2}at^2$

$= 3.1392 m$

f) position is **3.6 m over 3.1392 m down**

3.6m $\hat{x}$ + -3.1 m $\hat{y}$

#2 Kyle



$s = 9.5$	$s = -21.0$
$u = 4.59\frac{m}{s}$	$u = 0$
$v = 4.59\frac{m}{s}$	$v = -20.298\frac{m}{s}$
$a = 0$	$a = -9.81$
t 2.0691s	t 2.0691s

a) 2.07s

b) $4.59\frac{m}{s}$

c)

$u = \frac{s}{t} = \frac{9.5}{2.0691} = 4.5913\frac{m}{s}$

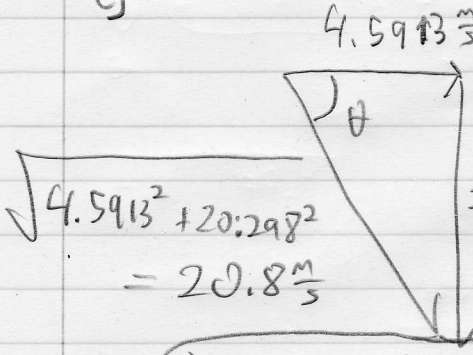
$v^2 = u^2 + 2as$

$|v| = \sqrt{2(-9.81)(-21.0)}$

$v = \pm 20.298$

But it's Negative

So -20.298



$\theta = \tan^{-1}\left(\frac{20.298}{4.59}\right)$

77.25

$\sqrt{4.5913^2 + 20.298^2} = 20.8\frac{m}{s}$

$s = ut + \frac{1}{2}at^2$

$t = \sqrt{\frac{2s}{a}} = \sqrt{\frac{2(-21)}{-9.81}}$

$= 2.0691\,s$

c) 20.8 m/s 77.3° Below Horiz

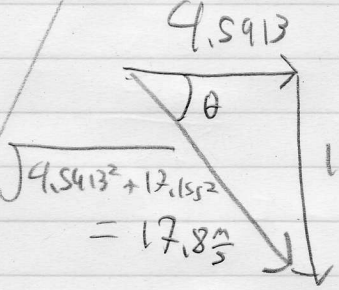
d)

H	V
$s = 8.029m$	$s = -15.0m$
$u = 4.5913$	$u = 0$
$v = 4.5913$	$v = 17.155$
$a = 0$	$a = -9.81$
t 1.7487s	$t = 1.7487s$

21-6

15.0 m down

$s = (4.5913)(1.7487)$



$\theta = \tan^{-1}\left(\frac{17.155}{4.5913}\right)$

75.00

$\sqrt{4.5913^2 + 17.155^2} = 17.8\frac{m}{s}$

$t = \sqrt{\frac{2s}{a}} = \sqrt{\frac{2(-15)}{-9.81}}$

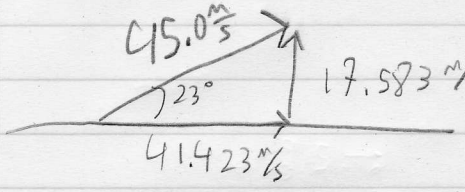
$|v| = \sqrt{2(-15)(-9.81)} = 17.155$

$v = -17.155$

d) $4.59\frac{m}{s}\hat{x} + -17.2\frac{m}{s}\hat{y}$

e) 17.8 m/s 75.0° Below Horiz.

(3)



	H	V
	S 148.49 m	S 0
Ground →	u = 41.423 m/s	u + 17.583 m/s
Ground	v = 41.423 m/s	v − 17.583 m/s
	a = 0	a = −9.81
	t 3.5847 s	t = 3.5847 s

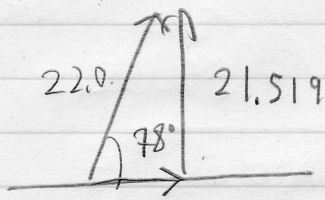
a) 41.4 m/s $\hat{x}$ + 17.6 m/s $\hat{y}$
b) 3.585
c) 148 m

$v = 17.583 = 17.583 - 9.81t$
$-t = 3.5847$ s

$S = ut$
$= (41.423)(3.5847)$

---

(4)



a) 4.57 m/s $\hat{x}$ + 21.5 m/s $\hat{y}$

Ground to top c) 23.6 m

Ground → Ground

	H	V
b)	S = 20.1 m	S 0
	u 4.5741	u +21.519
	v 4.5741	v −21.519
	a = 0	a = −9.81
	t = 4.3872 s	t = 4.3872 s

$S = ut$
$(4.5741)(4.3872) = 20.067$

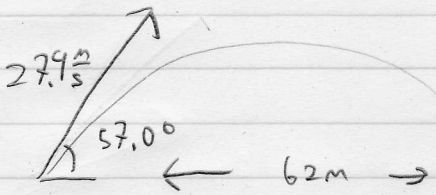
$v = u + at$
$-21.519 = 21.519 + (-9.81)t$

	H	V
	S	S = 23.6 m c)
	u 4.5741	u = 21.519
d)	v 4.5741	v = 0
	a	a = −9.81
	t	t

$v^2 = u^2 + 2as$
$0^2 = (21.519)^2 + 2(-9.81)s$
$= 23.6$ m

$V = 4.57 \frac{m}{s}\hat{x} + 0\frac{m}{s}\hat{y}$ Speed = 4.57 m/s

5



To the wall

h	V
$S = 62m$	$S = 10.80666\,m$
u 14.923 m/s	u 22.9796 m/s
v 14.923 m/s	$v = -17.7773\,m/s$
$a = 0$	a -9.81
$t = 4.1546$	t 4.1546

not yet on ground

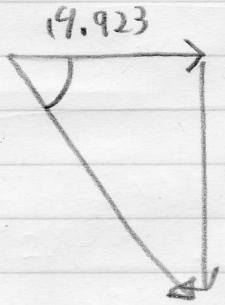
a) Hold that though t

b) 4.15 s

c) 10.8 m

d) $14.9\,m/s\,\hat{x} + -17.8\,m/s\,\hat{y}$ $\quad t = \frac{62}{14.923}$

e)



$\theta = \tan^{-1}\left(\frac{17.7773}{14.923}\right)$

$= 49.98$

50°

$V = u + at$

$(22.9796) + (-9.81)(4.1546)$

$S = ut + \frac{1}{2}at^2$

$= (22.9796)(4.1546) + \frac{1}{2}(-9.81)(4.1546)^2$

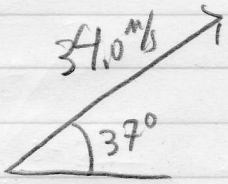
$= 10.80666$

$\sqrt{14.923^2 + 17.7773^2} = 23.2\,m/s$

a)

@ TOP V	
$S =$	$(v^2 - u^2)/2a = 26.9144\,m$
$u = 22.9796$	
$v = 0$ (TOP)	26.9m
$a = -9.81$	
t	

6



H	V
S 113.27 m	S = 0
u 27.154	u 20.962
v 27.154	v −20.962
a	a = −9.81
t 4.17165	t 4.1716 s
	= (v−u)/g

a) 113m

b) @ highest pt
Vertical Velocity = 0
So Speed = 27.2 m/s

$S = (27.154)(4.1716)$

C) - Next Page

OK So @ 2.00 seconds:

e) $54.3\text{m}\,\hat{x} + 21.3\text{m}\,\hat{y}$

H	V
S = 54.3m	S = 21.303
u 27.154	u 20.962
v 27.154	v = .8417 m/s
a = 0	a = −9.81
t 2.00	t 2.00

$S = ut$

$S = ut + \frac{1}{2}at^2$
$(20.962)(2) + \frac{1}{2}(-9.8)(2)^2$

$V = u + at$
$20.962 + -9.81(2)$
$V = .8417$ m/s

J)

27.154

$\sqrt{27.154^2 + .8417^2}$
27.1666 m/s
27.2 m/s

$\theta = \tan^{-1}\left(\frac{.8417}{27.154}\right)$
$= 1.780$

C) @ elevation 10m

H	V
s	s 10m
u 27.154	u 20.462
v	v + ____ (ball is up)
a	a -9.81
t	t

$v^2 = u^2 + 2as$

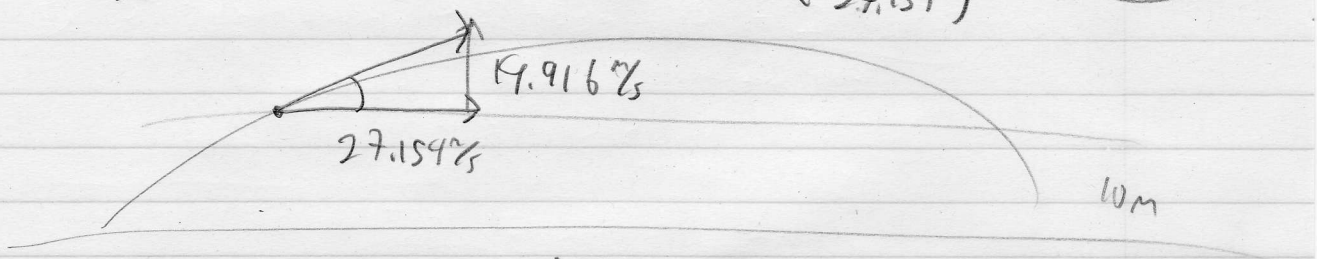
$v^2 = (20.462)^2 + 2(-9.81)(10)$

$|v| = 14.9158..$ m/s

$+14.9$ m/s is correct

So

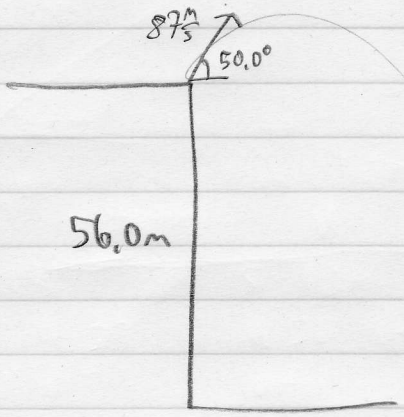
$\theta = \tan^{-1}\left(\frac{14.916}{27.154}\right) = 28.80$



$M_s = \sqrt{27.154^2 + 14.916^2}$

$= 31.0$ m/s

(7)



$S = 804.24$	$S = -56$
u 55.923	u 66.646
v 55.923	v -74.434
a 0	$a = -9.81$
t 14.381s	$t = 14.3815$

$S = ut$

$(55.923)(14.381)$

$v^2 = u^2 + 2as$

66.646

$|v| = 74.43$ m/s

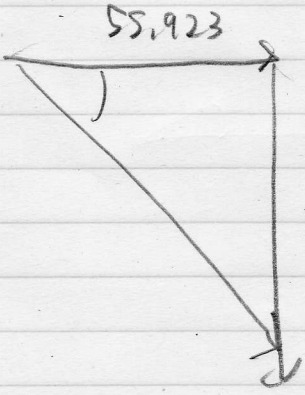
-74.434 m/s

is correct

On impact

$v = 55.9 \text{ m/s}\,\hat{x} + -74.4 \text{ m/s}\,\hat{y}$

$t = \frac{v-u}{a} = \frac{-74.434 - 66.646}{-9.81}$



$\theta = \tan^{-1}\left(\frac{74.434}{55.923}\right)$ $t = 14.381$s

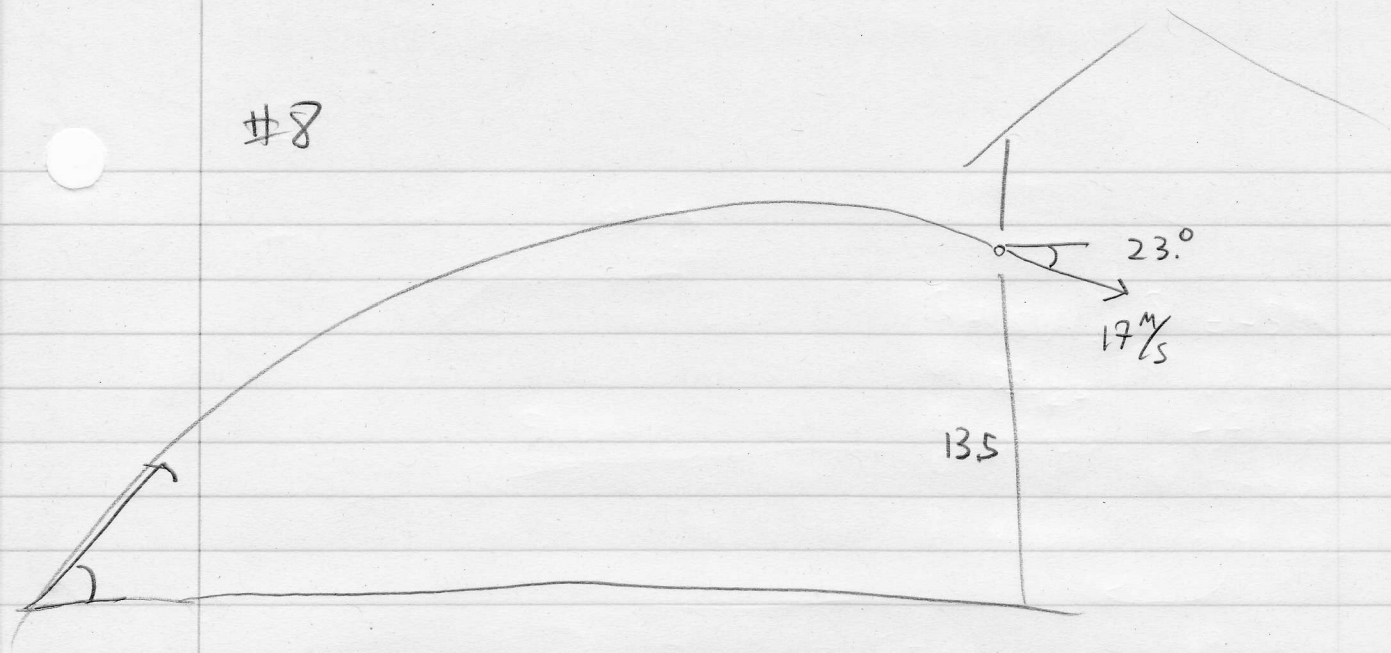
53.08

53.1°

$\sqrt{55.923^2 + 74.434^2}$

$= 93.1$ m/s

#8



a) $15.649\ \hat{x}\ m/s + -6.6424\ \hat{y}\ m/s$

Ground to window

H	V
S 38.6368	S 13.5
u 15.649	u 17.578
v 15.649	v -6.6424
a 0	a = -9.81
t 2.4690s	t 2.4690 s

$S = ut$

$(15.649)(2.4690)$

$V^2 = u^2 + 2as$

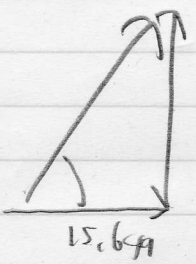
$|u| = \sqrt{V^2 - 2as}$

$u = 17.578\ m/s$ (+ is correct)

$V = u + at$

$t = (v-u)/a$

$t = 2.4690$



$\theta = \tan^{-1}\left(\frac{17.578}{15.649}\right)$

$48.3°$

$m_{GS} = \sqrt{15.649^2 + 17.578^2}$

$23.53\ m/s$