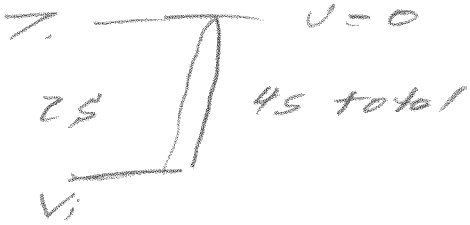
PROJ MOTION
PRE - TEST



Find V_i:

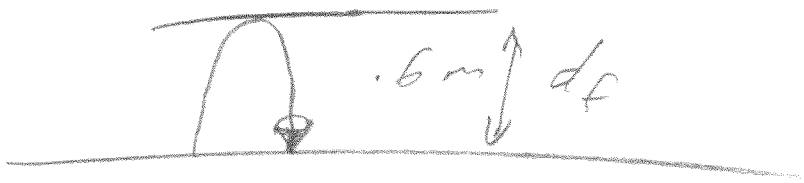
$V = gt$

$V = 10 m/s^2 \cdot 2.5$

$V_i = 20 m/s$

PROJ MOTION
PRE-TEST

9. What is t_H for .6m jump?



$$t = \sqrt{\frac{2d_f}{g}}$$

$$= \sqrt{\frac{2(.6m)}{10 m/s^2}}$$

$$t = .35s$$

Need $2 \cdot t$

$$t_H = 2(.35s)$$

$$= .7s$$

PROJECT MOTION
PRE-TEST

11. 

$a = 5 m/s^2$

$V_i = 5 m/s$

$V_f = 40 m/s$

$$a = \frac{V_f - V_i}{t}$$

$$t = \frac{V_f - V_i}{a}$$

$$= \frac{40 m/s - 5 m/s}{5 m/s^2}$$

$$\boxed{t = 7 s}$$

PROJ. MOTION
PRE-TEST

12. $0 \xrightarrow{a=6\,m/s^2}$ $t = 1\,s$

$$x = \frac{1}{2} a t^2$$

$$x = (.5)(6\,m/s^2)(1s)^2$$

$$\boxed{x = 3m}$$

13.

Find t

$$t = \sqrt{\frac{2d}{g}}$$

$$= \sqrt{\frac{2(1250m)}{10\,m/s^2}}$$

$$\boxed{t = 15.8\,s}$$

14.

$$x = \frac{1}{2} g t^2$$

FIND t

$$a = \frac{v_f - v_i}{t}$$

$$-10\,m/s^2 = \frac{0 - 13\,m/s}{t}$$

$$t = \frac{-13\,m/s}{-10\,m/s^2}$$

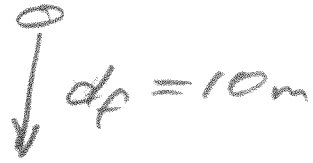
$$t = 1.3\,s$$

$$x = \frac{1}{2} g t^2$$

$$= (.5)(10\,m/s^2)(1.3\,s)^2$$

$$= 8.45\,m$$

15.



Find V

$V = gt$ $(V = at)$

$t = \sqrt{\frac{2d_f}{g}}$

$t = \sqrt{\frac{2(10m)}{10 m/s^2}}$

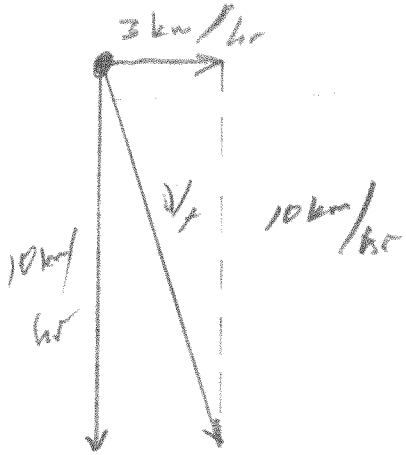
$t = 1.4 s$

$V = gt$

$= 10 m/s^2 \cdot 1.4 s$

$\boxed{V = 14.1 m/s}$

16.



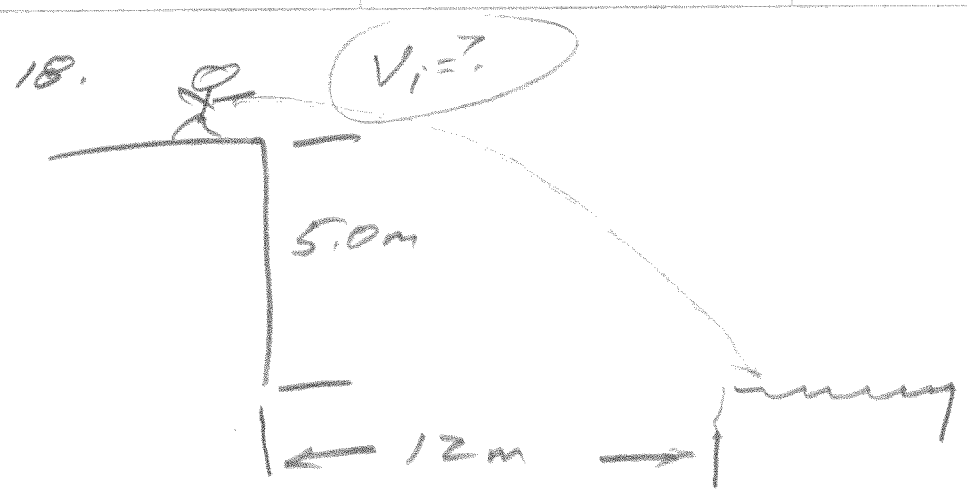
$V_f^2 = V_x^2 + V_y^2$

$V_f = \sqrt{3 km/hr^2 + 10 km/hr^2}$

$= \sqrt{109 \frac{km^2}{hr^2}}$

$\boxed{V_f = 10.44 km/hr}$

18.



Find $V_i = V_x$

Find t

$$t = \sqrt{\frac{2d_f}{g}}$$

$$= \sqrt{\frac{2(5.0m)}{10 m/s^2}}$$

$$= \sqrt{1 s^2}$$

$$t = 1 s$$

$$V_i = \frac{x}{t}$$

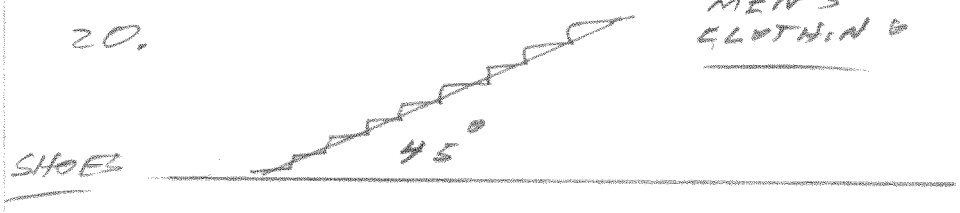
$$= \frac{12m}{1s}$$

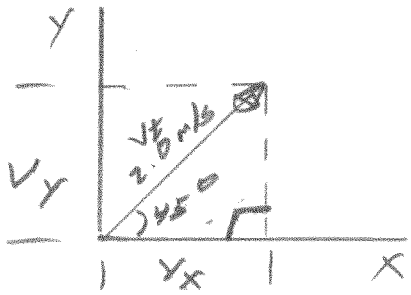
$$\boxed{V_i = 12 m/s}$$

PROJ MOTION
PRE-TEST

KEY

20.





Find V_x

$$V_x = \sqrt{V_x^2 + V_y^2}$$

$$V_x = V_y$$

$$V_t = \sqrt{2 V_x^2}$$

$$V_t^2 = 2 V_x^2$$

$$\frac{V_t^2}{2} = V_x^2$$

$$\sqrt{\frac{V_t^2}{2}} = V_x$$

$$\sqrt{\frac{(2\ m/s)^2}{2}} = V_x$$

$$\sqrt{\frac{4\ m^2/s^2}{2}} = V_x$$

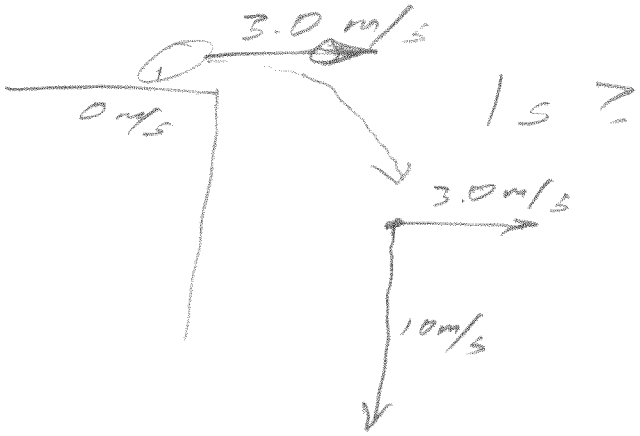
$$\sqrt{2\ m^2/s^2} = V_x$$

$$V_x = 1.41\ m/s$$

For 45° Vectors:

$$V_x = V_y = \sqrt{\frac{V_t^2}{2}}$$

22.



$v = g t$

$= 10 m/s^2 \cdot 1 s$

$v = 10 m/s$

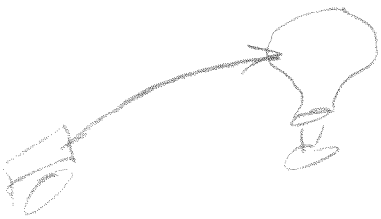
$s = \sqrt{v_x^2 + v_y^2}$

$= \sqrt{(3.0 m/s)^2 + (10 m/s)^2}$

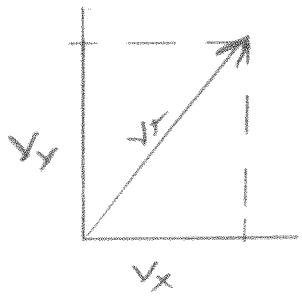
$\boxed{s = 10.4 m/s}$

PROJ MOTION
PRETEST

#23.



Boom!



Find V_x

$V_r = 51\ m/s$

$V_x = V_y$

$V_r^2 = V_x^2 + V_y^2$

$V_r^2 = V_x^2 + V_x^2$

$V_r^2 = 2V_x^2$

$\frac{V_r^2}{2} = V_x^2$

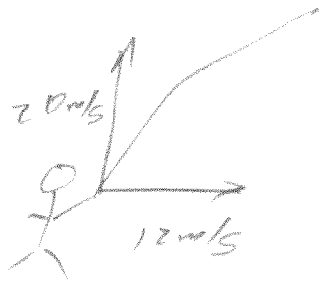
45° Launch → $V_y = V_x = \sqrt{\frac{V_r^2}{2}}$

$V_x = \sqrt{\frac{(51\ m/s)^2}{2}}$

$V_x = 36.1\ m/s$

@ TOP $\boxed{V_r = 36.1\ m/s}$

24.



$$v_x = 12\,m/s$$

$$\Delta s \quad v_y = v_0 + at$$

$$= 20\,m/s + -10\,m/s^2 \cdot 1s$$

$$v_y = 10\,m/s$$

$$s = \sqrt{v_x^2 + v_y^2}$$

$$= \sqrt{(12\,m/s)^2 + (10\,m/s)^2}$$

$$\boxed{s = 15.6\,m/s}$$

PROJ MOTION
PRE - TEST

Find V_x & V_y @ 4 s

$V_x = \text{const}$

$\boxed{V_x = 10\ m/s}$

$V_y = V_0 + at$

$= 30\ m/s + -10\ m/s^2 \cdot 4\ s$

$\boxed{V_y = -10\ m/s}$

OR count

t (s)	V (m/s)
0	30
1	20
2	10
3	0
4	-10

$s = \sqrt{V_x^2 + V_y^2}$

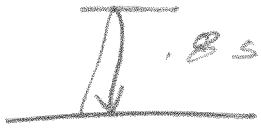
$= \sqrt{(10\ m/s)^2 + (-10\ m/s)^2}$

$= \sqrt{200\ m^2/s^2}$

$\boxed{s = 14.1\ m/s}$

PROJECT MOTION
PRE-TEST

27.



Some Max h.

Some d_x

Some t

$t = .8s$