HW # 1

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1) 36 ft = 10.9728 m
1 m = 3.28 ft = 39.37 in
1 ft = 0.3048 m

2) Sep wk 1 1370 cm = 13.7 m
1.575 mm = 1.575 m
~~2.374~~ m
8.63 m
26.3 m 23.905

3) 725 cm^2 $A = \pi r^2$
$r^2 = 725 cm^2 / \pi = 230.77$
$\sqrt{r^2} = r = \sqrt{230.77} = 15.19$

Check $(15.19)^2 = (230.77)$
$(230.77) * \pi = 725$.

4) skip

5) 255 m in 4.75 h $\frac{V_f - V_i}{2} =$
255 m / 4.75 h = 53.68 m/h

6) 10 m/s 2.75 s
speed = ~~distance~~ traveled / time
$(10 m/s) 2.75 s = 27.5 m$ above water

7) Object in Free Fall
speed / acceleration

HW #1

6) See section 4.3
How high is the bridge

Sep Example 5 pg 111
initial velocity cliff = 10 ft/s
Final velocity is 310 ft/s
$g = 32.2$ ft/s²

Basic Equation

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

How long is the rock in flight?

$$t = \frac{V_f - V_i}{a} = \frac{310 \text{ ft/s} - 10 \text{ ft/s}}{32 \text{ ft/s}^2}$$

$$= 300/32 = 9.375 \text{ seconds}$$

⑥

$V_i = 10$ m/s
$t = 2.75$ s
$a = 9.8$ m/s²

Sep pg 104

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

$$V_f = V_i + at$$
$$= (10 \text{ m/s}) + (9.8 \text{ m/s}^2)\, 2.75 \text{ s}$$
$$= 10 \text{ m/s} + 26.95 \text{ m/s}$$
$$= 36.95 \text{ m/s} = V_f$$

How high?

$$s = \frac{(V_f - V_i)t}{2} = \frac{(36.95_{m/s} - 10)(2.75 s)}{2}$$

$$= (26.95)(2.75)/2 = 37 \text{ m}$$

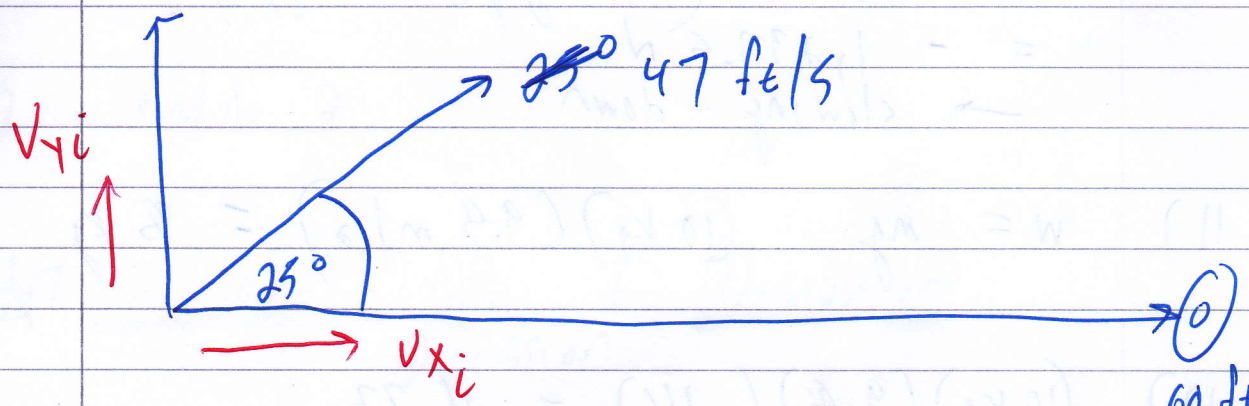
HW #1

7) Freely falling bodies undergo constant acceleration

$v = at \qquad s = at^2/2$

In free fall $v_f = g * t$

8) See example 2 page 120



$v_{xi} = (47 \text{ ft/s}) \cos(25°) = (.906)(47) = 42.59 \text{ ft/s}$

$v_{yi} = (47 \text{ ft/s}) \sin(25°) = (.422)(47) = 19.46 \text{ ft/s}$

Use equation (see text pg 119)

$v_f = v_i + at$

How long is arrow in the air

$\frac{v_f - v_i}{a} = t$ } Use vertical (y) component

$v_{fy} - v_{iy} = \frac{(19.46) - (-19.46 \text{ ft/s})}{32.2 \text{ ft/s}^2}$

$= \frac{39.72}{32.2} = \boxed{1.23 \text{ s}}$

How far? $s_x = (v_x t) = (42.59 \text{ ft/s}) = (42.59)(1.234)$

arrow falls short $\longrightarrow = 52.53 \text{ ft}$

9) what is inertia?

10) $m = 275\ kg$

$F = ma = (275\ kg)(-4.5\ m/s^2)$

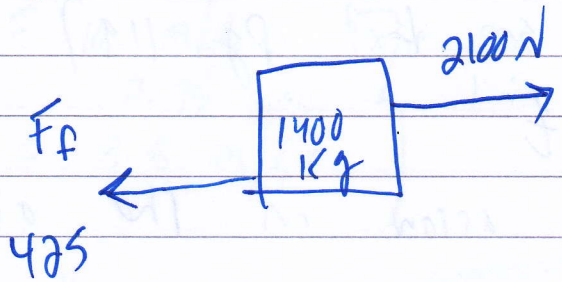
$= -1,237.5\ N$

→ slowing down

11) $w = mg \quad (10\ kg)(9.8\ m/s^2) = 98\ kg$

12) $(10\ kg)(9.8)(.166) = 16.33$

13) $F = ma$



$F_{TOTAL} = 2100N - 425N = 1675\ N$

$a = (1675\ kg\ m/s^2) / 1400kg = 1.2\ m/s^2$

14) F_N - The normal force