Name ___Saimer Nieves___ This prepares you for Midterm (Test 1)

Phy 200 HW3 chapters 1 & 2 (8 points each)

1. Convert 250 yds to ft. 1 yd = 3 ft

$$250 \text{ yds} \cdot \frac{3 \text{ ft}}{1 \text{ yd}} = 750 \text{ ft}$$

2. Convert 300 in³ to cm³. 1 in = 2.54 cm

$$300 \text{ in}^3 \cdot \frac{2.54 \text{ cm}}{1 \text{ in}} \cdot \frac{2.54 \text{ cm}}{1 \text{ in}} \cdot \frac{2.54 \text{ cm}}{1 \text{ in}} \Rightarrow 300 \text{ in}^3 \cdot \frac{16.387 \text{ cm}^3}{1 \text{ in}^3} = 4916.1 \text{ cm}^3$$

3. How much time does it take to travel a distance of 1300 miles with a velocity of 250 mi / hr.?

$$1300 \text{ mi} \cdot \frac{1 \text{ hr}}{250 \text{ mi}} = 5.2 \text{ hours}$$

4. A person bicycles a distance of 100 miles in a time of 7 hours. What was their average velocity?

$$\frac{100 \text{ mi}}{7 \text{ hrs}} = 14.29 \text{ mi/hr}$$

5. A ball rolls from a stop down a hill a distance of 500 m in a time of 20 seconds. A) What was its average velocity? B) What was its' final velocity? C) What was its' acceleration?

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

$$V = \frac{500 \text{ m}}{20 \text{ sec}} = 25 \text{ m/sec}$$

$$a = \frac{(25 \text{ m/sec} - 0 \text{ m/sec})}{20 \text{ sec}} \quad \boxed{1.25 \text{ m/sec}^2}$$

$$V_F = 0 + \frac{1.25 \text{ m}}{\text{sec} \cdot \text{sec}} \cdot 20 \text{ sec}$$

$$\left(V_{avg} = \frac{0 + 25}{2} \right)$$

$$\boxed{V_F = 25 \text{ m/sec}} \quad 1 \quad \boxed{V_{avg} = 12.5 \text{ m/sec}}$$

6. A ball is dropped on a planet far, far away. It reaches a final velocity of −200 m/ s in a time of 12 seconds. What was its acceleration on that planet?
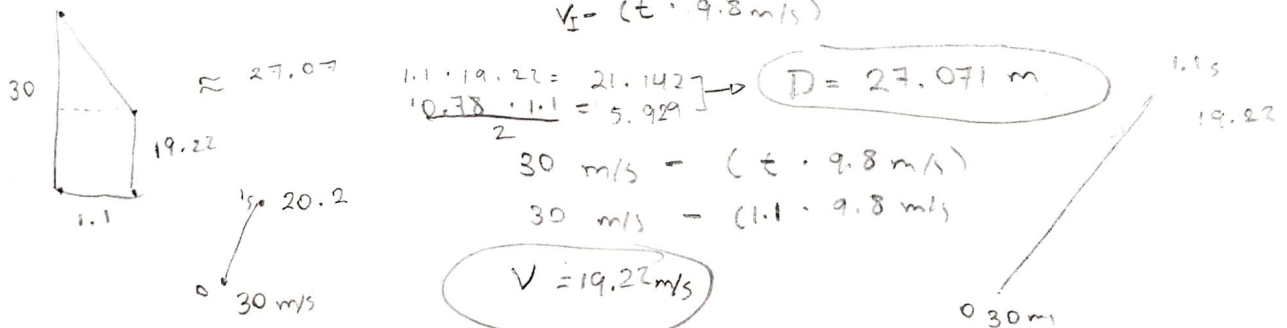
$$a = \frac{-200\,m/s - 0\,m/s}{12\,secs} = -16.667\,m/s^2$$

7. A car travels for a time of 3 hrs with a velocity of 55 miles / hour. How far did it travel?

$$X = vt$$

$$X = \frac{55\,miles}{1\,hour} \cdot \frac{3\,hour}{}$$

$$X = 165\,miles$$

8. A ball thrown upward with an initial velocity of 30 m / s. A) How fast is it traveling after 1.1 seconds? B) What distance has it traveled in that time?
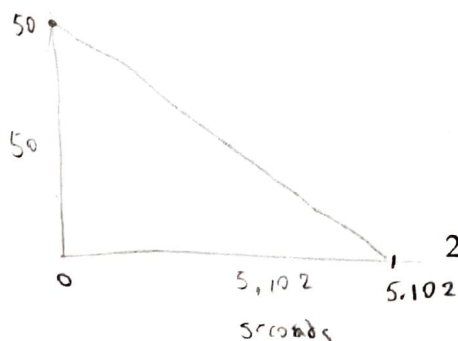
$$V_I - (t \cdot 9.8\,m/s)$$

≈ 27.07

$$1.1 \cdot 19.22 = 21.142$$
$$\frac{0.78 \cdot 1.1}{2} = 5.929$$
$$D = 27.071\,m$$

30

19.22

1.1

$\cdot$ 20.2

30 m/s

$$30\,m/s - (t \cdot 9.8\,m/s)$$
$$30\,m/s - (1.1 \cdot 9.8\,m/s)$$

$$V = 19.22\,m/s$$

1.1 s

19.22

0 30 m

9. A ball is thrown upward with an initial velocity of 50 m /s. A) How much time is it in the air? B) What height does it reach?

$$V_I - 9.8\,t$$

$$\frac{50}{9.8} = 5.102\,secs\ \ up$$

$$50 - 9.8 \cdot (5.102)$$

$$t = 5.102\,secs \times 2$$

$$V = 0$$

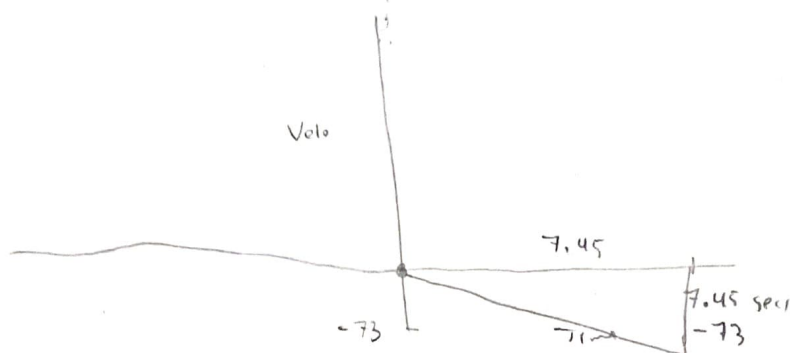$$t = 10.204\,secs \quad \leftarrow\ Time\ until\ it\ hits\ ground$$

50

50

$$A = \frac{b \cdot h}{2} \rightarrow \frac{5.102 \times 50}{2} = 127.55\,m$$

$$D = 127.55\,m$$

2

5,102   5.102

seconds

0⁻ 50 m/s

10. A ball is dropped. It has initial velocity of 0 m / s. It reaches a final velocity of −73 m / s in a time of 7.45 seconds. How far did it fall?

Velo

7.45

−73

7.45 sec

−73

−73

$A = \dfrac{b \cdot h}{2}$

$= \dfrac{73 \times 7.45}{2}$

$A = -271.925$

Distance $= -271.9$ m

11. A ball is dropped from a height of 1.5 meters. What time does it fall?

1.5 meters, $\dfrac{1 \text{ sec}}{9.8 \text{ meters}} = 0.153 \text{ secs}$

$t = 0.153 \text{ secs}$

12. A ball is dropped from a height of 1.5 meters, What is its' final velocity?

$V_F = V_I + a\,t$

$V_F = 0 + (-9.8 \text{ m/s}^2 \cdot 0.153 \text{ secs})$

$V_F = -1.4994 \text{ m/s}$