Phys 407

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Homework #1

1. $\left(\frac{12 \text{ inches}}{1 \text{ foot}}\right)\left(\frac{3 \text{ feet}}{1 \text{ yard}}\right)\left(\frac{1760 \text{ yards}}{1 \text{ mile}}\right)$ [illegible] $\left(\frac{1 \text{ step}}{\text{[illegible]}}\right)$

1 step = 1 yard = 36 inches

It takes [illegible] 1,760 steps to walk a mile

2. $\left(\frac{3 \times 10^8 \text{ meters}}{1 \text{ sec}}\right)\left(\frac{60 \text{ sec}}{1 \text{ min}}\right)\left(\frac{60 \text{ mins}}{1 \text{ hour}}\right)\left(\frac{24 \text{ hours}}{1 \text{ day}}\right)\left(\frac{365.25 \text{ days}}{1 \text{ year}}\right)\left(\frac{4.1 \text{ ly}}{\text{Dist. from}}\right)$

The distance from our sun to Alpha Centauri is $3.88 \times 10^{}$

3.88×10^{16} meters $\left(\frac{100 \text{ cm}}{1 \text{ meter}}\right)\left(\frac{1 \text{ inch}}{2.54 \text{ cm}}\right)\left(\frac{1 \text{ mile}}{63{,}360 \text{ inch}}\right)$

which is the same as [illegible] about 24 trillion miles

3.

Volume: $164 \times 84 \times 6.58$ [illegible] $\approx 90{,}692 \text{ ft}^3 \approx 677{,}258.9$ ga

$164 \times 12 \times 2.54 = 4{,}998.72$ cm

$84 \times 12 \times 2.54 = 2{,}560.32$ cm

$10 \times 6.58 \times 2.54 =$ [illegible] 200.5584 cm

$4{,}998.72 \times 2{,}560.32 \times 200.5584 \approx 2{,}566{,}811{,}141.5$ cm

$2{,}566{,}811{,}141.5 / 1000 / 3.79 = 677{,}258.9$

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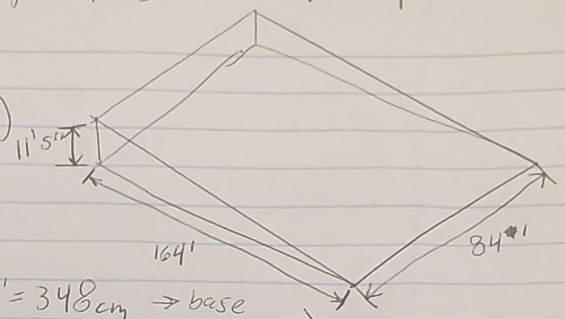
3 (cont.)



11'5" = 348 cm → base
164' = 5000 cm → height
84' = 2560 cm → width/depth

$348 \cdot 5000 \cdot 0.5 \cdot 2560$
$= 1{,}587{,}200{,}000\ cm^3$

$1{,}587{,}200{,}000\ mL \leftarrow 1{,}587{,}200\ L \leftarrow 419{,}293.9\ gal$

$419{,}293.9 + 677{,}258.9 = \boxed{1{,}096{,}552.8\ gal}$

4. ~~Estimate = 10 lbs~~

~~Volume = [illegible] ft^3~~

Diameter = 1 ft

Volume = $4.189\ ft^3 = 0.1186\ m^3$

$$\left(\frac{1000\ kg}{1\ m^3}\right)\left(\frac{0.1186\ m^3}{1\ head}\right) = 118.6\ kg = 261.5\ lbs$$

It does not seem realistic

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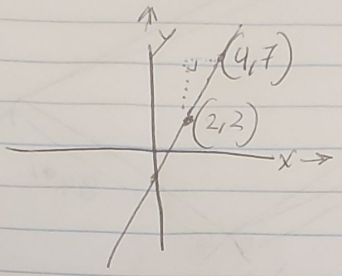
5.



$2 = 5 + b$

$5/2 = m$ $\quad b = -3$

$\Delta y / \Delta x$

$y = 5/2\,x - 3$

6.

$$x + 3 = -\frac{2}{7} + 3x \rightarrow 3 + \frac{2}{7} = 3x - x \rightarrow \frac{23}{7} = 2x$$

$$\frac{23}{7} \div 2 = \frac{2x}{2}$$

$x = (23/7)/2$

7. $3/4 + L = \frac{1}{x} \rightarrow x = \frac{1}{3/4 + L}$

8.

4	5	6	2	3	1
5	1	4	6	2	3
3	2	5	4	1	6
6	4	3	1	5	2
2	6	1	3	4	5
1	3	2	5	6	4