

≡ KEY ≡ HOMEWORK #1

Welcome to the homework page, **test2**. If this isn't you then please go back to the homework login page.

You may log out and return later if you wish without losing any saved data. You will have **TEN** attempts for each assigned problem. Every unsuccessful attempt will lower that part of the problem's value by 5%.

For example, if you get it right on the first try, then you will receive 100% for that problem. If you are twice incorrect and submit the correct on the third try, then you will receive a 90% for that part of the problem. You will not receive any points for that part of the problem after 10 attempts.

You do not have to answer all the problems during a single session or in any particular order. To answer a problem simply type the numerical value in the box provided, check the box to the right of the part(s) you want to answer, and then click the submit button. You can freely log in and out of the homework page without losing any submitted information so feel free to take breaks if necessary.

LETS BEGIN!

Problem #1

→ $(67.4 \text{ m}) \left(\frac{1.09 \text{ yd}}{1 \text{ m}} \right) \left(\frac{3 \text{ ft}}{1 \text{ yd}} \right) \left(\frac{12 \text{ in}}{1 \text{ ft}} \right) = 2644.8 \text{''}$

(a) A FIFA Soccer field is 67.4m meters wide. Convert that width to inches. (b) Convert 742.54 lbs to Kg.

→ $742.54 \text{ LB} \left(\frac{.454 \text{ kg}}{1 \text{ LB}} \right) = 337 \text{ kg}$

(a) in Answer part (a)

(b) Kg Answer part (b)

Submit

Attempted part (a) 0 times and part (b) 0 times.

There have been no attempts to answer part (a)

There have been no attempts to answer part (b)

$$1.48 \frac{\cancel{\text{€}}}{\cancel{\text{L}}} \left(\frac{1.15 \$}{1 \cancel{\text{€}}} \right) \left(\frac{3.785 \cancel{\text{L}}}{1 \text{ GAL}} \right) = 6.44 \frac{\$}{\text{GAL}}$$

Problem #2

(a) Gas costs (in France) 1.48 euros per liter. A euro is 1.15 dollars. What is the gas cost in dollars per gallon? (b) Suppose the moon is about 203300 miles away. What is that distance in microns?

$$(203300 \text{ mi}) \left(\frac{1.61 \text{ km}}{1 \text{ mi}} \right) \left(\frac{1000 \text{ m}}{1 \text{ km}} \right) \left(\frac{10^6 \text{ μm}}{1 \text{ m}} \right) = 3.27 \times 10^{14} \text{ μm}$$

(a) \$/gal Answer part (a)

(b) microns Answer part (b)

Submit

Attempted part (a) 0 times, part (b) 0 times.

There have been no attempts to answer part (a)

There have been no attempts to answer part (b)

Problem #3

$$(42.6) \left(1 + \frac{15.52}{100} \right) = 49.21$$

(a) The bill for dinner with your date comes to \$42.6. To give a 15.52 percent tip what should the total bill be? (b) Suppose your income last year was \$78446.29. This year it increased to \$90867.91. Determine the percentage increase in your income.

$$\% \text{ increase} = \frac{90867.91 - 78446.29}{78446.29} = 15.83$$

(a) \$ Answer part (a)

(b) % Answer part (b)

Submit

Attempted part (a) 0 times and part (b) 0 times.

There have been no attempts to answer part (a)

There have been no attempts to answer part (b)

Problem #4

$$\frac{\text{INTEREST}}{\text{PERSON}} = \frac{(12.83 \times 10^{12})(.0126)}{297.05 \times 10^6} = \$544$$

$$\text{OR } \frac{544}{51350} = .0106 = \underline{1.06\%}$$

Our national debt is about 12.83 trillion dollars. There are 297.05 million americans. If each is earning about \$51.35 thousand per year, and the interest rate on the debt is 1.26 percent,

- (a) what percentage of each person's annual income goes to service the debt?
- (b) Suppose like a house payment, we were asked to pay down the debt over the course of 23.35 years. The bankers, overjoyed at that prospect, agree to do it at a rate that corresponds overall to paying 1.2 times the total debt now over that period. What would be each person's annual payment be?

(a) % Answer part (a)

$$\frac{(12.83 \times 10^{12})(1.2)}{(23.35)(297.05 \times 10^6)} = \$2219.7 / \text{PERSON}$$

(b) \$ Answer part (b)

Attempted part (a) 0 times and part (b) 0 times.

There have been no attempts to answer part (a)

There have been no attempts to answer part (b)

Problem #5

The molecular weight of a particular drug is 4260.11 g/mol. How many drug molecules are in a single (typical) dose, about 45.52 milligrams?

molecules Answer to the question

$$N = \# \text{ MOLES} \cdot N_A = \frac{(45.52 \text{ mg}) \left(\frac{1 \text{ g}}{1000 \text{ mg}}\right)}{4260.11 \text{ g/MOLE}} \cdot 6.02 \times 10^{23} \frac{\text{MOLES}}{\text{MOLE}}$$

$$= 6.43 \times 10^{18} \text{ MOLECULES}$$

Attempted the problem 0 times.

There have been no attempts to answer the problem

Problem #6

Suppose that a spacecraft orbiting near the earth moves at about 17306.9 MPH. Folks in aeronautics measure these high speeds in so called "mach" number after physicist Ernst Mach. It's just what multiple of the speed of sound...as in "mach 1" is something moving at the speed of sound, "mach 2" is something moving twice the speed of sound, etc. Suppose that the speed of sound is 365.3 m/s.

- (a) How many mach is the spacecraft near the earth going?
- (b) To escape entirely from the gravity of the moon you need to go about 8 mach. How fast is that in Km/s?
- (c) The fastest probes we've launched go about 30 Km/s. How long in years would it take such a probe to leave the solar system completely, going a distance of 10.9 billion miles?
- (d) How many mach is the speed of light?

(a) Answer part (a)

(b) Km/s Answer part (b)

(c) years Answer part (c)

(d) Answer part (d)

$$(17306 \text{ MPH}) \left(\frac{1.61 \text{ km}}{1 \text{ mi}} \right) \left(\frac{1000 \text{ m}}{1 \text{ km}} \right) \left(\frac{1 \text{ hr}}{3600 \text{ s}} \right) \times \left(\frac{1 \text{ Mach}}{365.3 \text{ m/s}} \right) = 21.19 \text{ Mach}$$

$$8 \text{ Mach} \left(\frac{365.3 \text{ m/s}}{1 \text{ s}} \right) = 2.92 \text{ Mach}$$

$$t = \frac{d}{v} = \frac{10.9 \times 10^9 \text{ mi} \left(\frac{1.61 \text{ km}}{1 \text{ mi}} \right)}{30 \text{ km/s}}$$

$$t = 5.85 \times 10^8 \text{ s}$$

$$t = (5.85 \times 10^8 \text{ s}) \left(\frac{1 \text{ yr}}{3.1 \times 10^7 \text{ s}} \right) = 18.87 \text{ yrs}$$

d) : $c = 3 \times 10^8 \text{ m/s} \left(\frac{1 \text{ Mach}}{365.3 \text{ m/s}} \right) = 8.21 \times 10^5 \text{ Mach}$

Attempted part (a) 0 times, part (b) 0 times, part (c) 0 times, and part (d) 0 times.

- There have been no attempts to answer part (a)
- There have been no attempts to answer part (b)
- There have been no attempts to answer part (c)
- There have been no attempts to answer part (d)

Problem #7

A cylindrical drum holds 46.52 gallons. It has a height of 0.93 m.
 (a) Compute the diameter of the drum (in meters).

0.491

m. Answer the question

Submit

$$V = 96.52 \text{ gal} \left(\frac{3.785 \text{ L}}{1 \text{ gal}} \right) \left(\frac{1 \text{ m}^3}{1000 \text{ L}} \right) = 0.176 \text{ m}^3$$

$$V = \pi R^2 h \Rightarrow R = \sqrt{\frac{V}{\pi h}} = \sqrt{\frac{0.176 \text{ m}^3}{(3.1415)(0.93)}} = 0.245 \text{ m}$$

Attempted the problem 0 times.

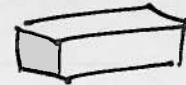
So diam = 2R = 0.491 m

There have been no attempts to answer the problem

Problem #8

$$= \frac{3.6 \text{ ft} \times 7.3 \text{ ft} \times 3.8 \text{ ft}}{1.07 \text{ ft}} = \frac{1.101 \text{ m} \times 2.232 \text{ m}}{1.162 \text{ m}}$$

A tank that is 3.6 ft wide by 7.3 ft long by 3.8 ft high. It fits in the back of a truck and we'd like to know (a) what is the volume in m³? (b) When filled with oil (density 0.8 g/cm³) what is its weight (in Kg)?



$$V = lwh$$

$$V = (1.101)(2.232)(1.162)$$

$$V = 2.856 \text{ m}^3$$

(a) m³

Answer part (a)

(b) Kg

Answer part (b)

Submit

DENSITY : $\rho = 0.8 \text{ g/cm}^3 = 800 \text{ kg/m}^3$

$$M = \rho V = (800 \text{ kg/m}^3)(2.856)$$

$$= 2285 \text{ kg}$$

Attempted part (a) 0 times and part (b) 0 times.

There have been no attempts to answer part (a)

There have been no attempts to answer part (b)