

1. If the earth became 10X denser than it was originally, what would the radius of earth have to be (meters) to have the same gravitational attraction?
2. If earth's mass is changed to pure energy, and all the energy was used to charge dead iphone 6, and every iphone charged had its mass turned into pure energy, how many times more energy is made then the energy made by the sun in 1 second?
3. What is 1,000,000!
4. If an object with the mass of the sun had the radius of planck's length what is its escape velocity?
5. How many photons of light does the sun emit in a second?
6.  $10^{10}10^{10}10^{-100}$
7. Throughout its life, how many liters of STP oxygen will a RBC carry?
8. If a 220 lb man runs at the speed of light, how many Calories of energy will be used?
9. If you gained the ability to see infrared and UV how fast do you need to move in m/s so that infared your moving to appears like UV?
10. If 2 earths were somehow separated by a distance of 1 meter, and each earth gained an electron per each atom the earth contains, what is their initial repulsion in newtons?
11. A sphere has the radius of 1 meter. How many Earths do you have to cram into the object to create a black hole?
12. In a alternate dimension, the speed of light has changed. Earth is now a black hole. What is the fastest possible speed of light in m/s?
13. Assuming lowerbound how many w/m<sup>2</sup> of sound is created initially by a M84 flash grenade
14. You decided to race a CO<sub>2</sub> particle. Assuming you run at a average pace, how many parsecs is the CO<sub>2</sub> particle ahead of you after a galactic year?
15. How many Einsteins of green light would you need to equal the energy created if you turned Einstein into pure energy?

All values were checked by calculator and should be correct. Answers should be off by no more than 1 maximum

Answer:

1. 6 (Because it is density not weight the earth's mass would increase if radius increase. Volume which is cubed increases mass, and in the distance would increase only squared so the gravitational attraction increases by  $N^3/N^2$  or by  $N$  times with a radius increase. Because the density is higher 10X the radius decreases 10X of earth's original radius)
2. 27 (Use  $E=mc^2$ )
3. 5565709 (Use equation  $N \log(N) - N(.4342944) + \log(\sqrt{N})$ )
4. 27 (Use  $\sqrt{2GM/R}$ )
5. 45 (Use speed of light/average wavelength of light=frequency times planck's constant=energy/photon, use the reciprocal for photons/joule times energy output of sun)
6. 10 ( $10^{-100}$  is some small insignificant number which  $10^{(10^{-100})}$  is basically 1.  $10^1$  is 10,  $10^{10}$  is Fermi 10)
7. -7 (RBC carries  $8 \times 10^8$  molecules at a time, cycles once per min, lifespan 60 days, convert to mole, then to liter (about 22 liters of air per mole))
8. 15 (Use  $\frac{1}{2}mv^2$  and convert to Calories)
9. 9 (apparent frequency= (speed of light-speed your moving at)/speed of light times actual frequency))
10. 72 ( $k(\text{charge 1 times charge 2/distance}^2)$ )
11. 2. (Use schwarzschild's radius)
12. 4 (Also use schwarzschild's radius)
13. 5 (170 decibels converted to  $w/m^2$ )
14. -6 (speed of CO2 is 500 m/s you run around 4 m/s over 250,000,000 years)
15. 14 (green light has a energy of  $3E-19$ , a Einstein is a mole of photon and Einstein produces around 19 joules)