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sol31long.txt

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Schwarzschild radius and gravitational units

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c [m/s] = 0.2998E+09 speed of light
G [m^3/(kg*s^2)] = 0.6674E-10 gravitational constant
y [s] = 0.3154E+08 year
ly [m] = 0.9454E+16 light year xly
em [kg] = 0.5972E+25 earth mass
r [m] = 0.6371E+07 earth radius
g [m/s^2] = 9.8195 = G*em/r^2 earth surface grav acceleration

(a) Earth Schwarzschild radius sr=2*G*m/c^2 [m] = 0.8869E-02
    Ratio sr/r [dimensionless] = 0.1392E-08

(b) G=c=1 and everything in seconds [s]:

[m] = [s]/c = 0.3336E-08 from 1 = c [m/s] => meter [s] = xm
[kg] = G [m^3/s^2] = 0.2477E-35 from 1 = G [m^3/(kg*s^2)] => kg [s] = xkg
[g] = (em*xkg)/(r*xm)^2 = 0.3275E-07 g [1/s] uses m [s], kg [s] as calculated

Earth mass [s] = 0.1479E-10
Earth radius [s] = 0.2125E-01
Ratio 2*em/r = sr/r [dimensionless] = 0.1392E-08

(c) G=c=1 and everything in years [y]:

meter [y] = 0.1058E-15 previous [s] in [y]
kg [y] = 0.7854E-43 previous [s] in [y]
g [1/y] = 1.033 previous [s] in [y]

In units [ly/y] we have c=1. Compare grav.f

Earth mass [y] = 0.4690E-18
Earth radius [y] = 0.6739E-09
Ratio 2*em/r = sr/r [dimensionless] = 0.1392E-08

(d) G=c=1 and everything in meters [m]:

second [m] = 0.2998E+09 from 1 = c [m/s]
kg [m] = 0.7425E-27 from 1 = G [m^3/(kg*s^2)]
g [1/m] = 0.1093E-15 from s [m], kg [m]
g [m/s^2] check = 9.820

Earth mass [m] = 0.4434E-02
Earth radius [m] = 0.6371E+07
Ratio 2*em/r = sr/r [dimensionless] = 0.1392E-08

(e) G=c=1 and everything in light years [ly]:

The same as everything in years, because
ly = c*y and we use c = 1 units.

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