

Mass photon*velocity photon=mass ball*velocity ball

Let two 1 kg balls opposite to each other at a distance of 1 m

Move one of the balls in the opposite direction of the other ball

The second ball moves after the first ball due to gravity

Move the first ball such that the two balls are equidistant from each other by one meter

The acceleration of the second ball is equal to

$$A = Gm_1m_2/r^2$$

Where m_1 is first ball m_2 is second ball

$$A=1 \text{ m/s}^2$$

Convert the acceleration of second ball to velocity

$$G=x/t^2 \text{ (acceleration)}$$

$$x=At^2 \text{ (velocity)}$$

$$\text{And that } x=Gt^2$$

Now we need to get the time to convert acceleration to velocity

The distance covered by one photon in one second is c or the speed of light = 299792458 m

We substitute c with x and we get that t^2 equals

$$x/G=4.491891886 \cdot 10^{18} t^2=2119408381$$

Now we try to find the theoretical velocity of the second accelerated ball

$$x/t=0.1414510109$$

Now we try to find the mass of photon

Mass of photon=mass of ball*theoretical velocity of ball/velocity of light

$$\text{Therefore mass of photon} = 1 \cdot 0.1414510109 / 299792458 = 4.718297846 \cdot 10^{-10} \text{ kg}$$