HW: Density of the sun

According to NASA (source: https://spacemath.gsfc.nasa.gov), the best-fit formula $D(x)$ represents the density of the sun (in g/cm^3) is: $\boxed{D(x) = 519x^4 - 1630x^3 + 1844x^2 - 889x + 155}$

where x represents the distance from the core ($0 \le x \le 1$).

Therefore: $x = 0 \Rightarrow D(0)$ is the density at the core

$x = 1 \Rightarrow D(1)$ is the density at the surface

So to calculate the average density of the sun; I will calculate the density at the midway point from the core to the surface ($x = 0.5$)

$\Rightarrow D(0.5) = 519(0.5)^4 - 1630(0.5)^3 + 1844(0.5)^2 - 889(0.5) + 155$

$\approx 0.1875\ g/cm^3$

I planned to take the average density from $x = 0 \to x = 1$ at first but I realized each region has a different area and the dense core might affect the number so much so I take the midway point density instead.