\[ g = \frac{Mg}{R^2} \Rightarrow M = \frac{gR^2}{G} \]

(d) (6 pts) What value will he give you for the mass of the planet? Show your work, and use proper units.

\[
\text{mass} = \frac{\frac{g R^2}{G}}{ } = \frac{(5.23)(1.72 \times 10^6)^2}{6.67 \times 10^{-11}}
\]

\[= 2.32 \times 10^{23} \text{ kg} \]

(e) (3 pts) Gold is very heavy. In fact, 1 cubic centimeter of gold has a mass of 19.3 grams. What would the mass of the planet be if it were made of gold? Show your work and use proper units.

\[
\text{mass if gold} = (0.0193)(2.13 \times 10^{14})(10^2)^3
\]

\[= 4.11 \times 10^{23} \text{ kg} \]

(f) (2 pts) Could the planet be pure gold? Explain your answer.

\[ \text{gold? No} \]

\[ \text{why? Mass of planet } (2.32 \times 10^{23} \text{ kg}) \text{ too small compared to mass of gold } (4.11 \times 10^{23} \text{ kg}). \]