6. [15 points] Kiki is beginning to experiment with time travel. She is sending her old math notebooks through time to test her machine. The machine is not working the way she intended:

- When a notebook of mass m kg is put into the machine, it travels in time $y = g(m)$ years (positive y means travel into the future, and negative y means travel into the past).

- Kiki's level of irritation while putting notebooks into her time machine, I, measured in frustrits (a unit of irritation) is a **linear** function of m, the mass, in kg, of the notebook she puts into the machine (i.e. $I = f(m)$ for some function f).

a. [6 points] Give practical interpretations of the following:

- $f^{-1}(1) = \frac{4}{3}$.

- $g(4) = -3$.

b. [6 points] For each of the following composition of functions, give a practical interpretation of the composition or explain why the expression does not make practical sense.

- $f(g(5))$

- $f(g^{-1}(2))$

c. [3 points] If a notebook of mass 4 kg is put into the machine, Kiki's irritation level is 3 frustrits, and if a notebook of 7 kg is put into the machine, Kiki's irritation level is 8 frustrits. Using this information, find a formula for the function f.

$$f(m) = \underline{\hspace{5cm}}$$