4. [13 points]

    a. [6 points] Two companies, Altor and Bear, decide to invest in Cease, a small start up company, in January 2014. Let $A(m)$ and $B(m)$ be the money invested in Cease, in thousands of dollars, m months after January 2014 by Altor and Bear, respectively.

        i) Find a formula for $I(y)$, the amount of money, in thousands of dollars, invested by Alton and Bear on Cease *y years* after January 2014.

    Solution: $A(12y) + B(12y)$

        ii) Assume that only Alton and Bear invest in Cease. Find a mathematical expression that represents the fraction of the money invested in Cease by Alton in *March 2014*.

    Solution: $\dfrac{A(2)}{A(2) + B(2)}.$

    b. [7 points] A patient has a high fever and goes to a hospital. At the hospital, the patient receives a fever reducing medication intravenously to reduce his body temperature.

        • Let $F(s)$ be the amount of medication (in milligrams) in the patient's body s minutes after the medication was administered.

        • Let $G(s)$ be the patient body's temperature (in °F) s minutes after the medication was administered.

Assume that the functions F and G are invertible. Find practical interpretation of the following mathematical expressions:

    i) $G(100) = 105$

    Solution: The patient body's temperature is 105° F one hundred minutes after the medication was administered.

    ii) $F^{-1}(100)$

    Solution: The number of minutes after the medication was administered at which the patient has 100 milligrams of medication in his body.

    iii) $F(G^{-1}(100))$

    Solution: The amount of medication in the patient's body when his body temperature is 100°F.