Economics 301
Problem Set due November 17, 2023   Upload your answers to canvas

1) Here we consider possible effects of public policies on skill development of children who have not yet reached the age to attend school. The development is accelerated to the extent that the parent (here we assume just one) spends time with the child; let $m \geq 0$ denote the amount of that time. The value of the child's skill is $v*m*f(h)$, where v is a constant and $f(h)$ indicates the productivity of parent time as a function of resources $h \geq 0$ put into enhancing the parent's ability to enhance the child's development. f is a strictly increasing and strictly concave function. Parent time m has strictly convex opportunity cost $c(m)$. The parental choice variables are m and h.

   a) Is the convex cost specification inconsistent with the claim that the parent values time with the child even beyond its contribution to child development?

   b) Under what conditions would the corner solution $h = 0$ maximize the net value $vmf(h) - h - c(m)$? Could there be more than one optimum?

   c) If the above maximization problem were replaced with $vmF(h) - h - c(m)$, with $f(h) \leq F(h)$ for all h, must the optimal parent time m be (weakly) greater in this second case?

   d) Show how parametric changes in the marginal cost $c'(m)$ of parent time have a multiplicative effect on the equilibrium marginal cost and marginal benefit of parent time. [Hint: to examine a parametric change in marginal cost, take $c(m) = \hat{c}(m) + \alpha m$ and calculate a comparative static with respect to α].

   e) Government program H brings social workers to a village to help reduce the marginal cost of h, without affecting any of the other model parameters. That is, program H helps parents be better teachers of their children. Government program T takes a different approach, in a different village, by having the social workers teach each child directly without the parent present. Assuming that the two villages receive the same amount of social-worker time, what conditions determine which program will add the most to child development?

2) Artificial intelligence is a powerful writing assistant, but it has been programmed to refuse to support the writing about politically-incorrect ideas. <u>True, False, or Uncertain</u>: this technology reduces the wages of writers with politically-incorrect opinions.