1. Suppose workers are paid according to a tournament model. The expected probability of winning the tournament is \( P \) which depends on effort, \( E \), as follows: \( P = \frac{1}{10} \sqrt{E} \). The cost of supplying effort is \( \varphi(E) = E \). If a worker wins the tournament, the worker gets $200. If the worker loses, he/she gets $100.

(a) Solve for the optimal level of effort, \( E \).

(b) What is the worker’s probability of winning the tournament?

(c) What is a potential drawback of using a tournament model to elicit effort?

2. Evaluate the following statement: Competition among firms drives out discrimination. Under what conditions does this statement hold and when could it not hold. Consider how the statement applies to the three different distinct types of discrimination.

3. All workers start working for a particular firm when they are 20 years old. The value of each worker’s marginal product is $18 per hour. In order to prevent shirking on the job, a delayed-compensation scheme is imposed. In particular, the wage level at every level of seniority is determined by:

\[
\text{wage} = 10 + (0.4 \times \text{years in the firm})
\]

Suppose the discount rate is 0 for all workers. What will be the mandatory retirement age under the compensation scheme?

4. Compare two unemployed workers: the first is 25 years old and the second is 55 years old. Both workers have similar skills and face the same wage offer distribution. Suppose that both workers also incur similar search costs. Which worker will have the higher asking wage? Can search theory explain why the unemployment rate of young workers differs from that of older workers? What other theories can explain the differences?