本份試卷共 9 大題計算問答題，未提供計算過程或說明者不計分。

1. *(10 points)* A consumer has preferences between two goods that are perfect substitutes. Please describe how you change prices for the entire demand response is due to the income effect?

2. *(10 points)* The prices are (p1, p2)=(2,3), and the consumer is consuming (x1, x2)=(4, 4). If the prices change to (q1, q2)=(2, 4). Could the consumer be better off under these new prices?

3. *(10 points)* If leisure is an inferior good, can you describe the shape of the labor supply curve?

4. *(10 points)* A firm has a supply function given by S(p)=4p. Its fixed costs are 100. If the price changes from 10 to 20, what is the change in its profits?

5. *(10 points)* If D(p)=100/p and c(y)=y^2, what is the optimal level of output of the monopolist?

6. *(20 points)* Based on your understanding of the aggregate supply and aggregate demand model and the IS-LM model, graphically illustrate and explain what effect an increase in the minimum wage will have on the economy (i.e. the effect on output, unemployment rate, interest rate and real wage). In your graphs, clearly illustrate the short-run and medium-run equilibria. Also include in your answer an explanation of the effects of this change in the minimum wage on the labor market and the equilibrium real wage.

7. *(10 points)* Suppose a liquidity trap exists and output is below its natural level. Graphically illustrate and explain if the economy can return to its natural level using the AS-AD model.

8. *(10 points)* Discuss the implications of a liquidity trap for the shapes of the money demand and LM curves.

9. *(10 points)* Suppose policy makers pass a budget that results in a reduction in the budget deficit. Also assume that this fiscal policy action results in an increase in the saving rate. To what extent will this increase in the saving rate cause permanent changes in the rate of growth of output per worker? Explain.

每題 10 分

1. Suppose a manufacturer's profit from the sale of radios is given by the function $P(x) = 400(15 - x)(x - 2)$, where x is the price at which the radios are sold. Find the selling price that maximizes profit.

2. The daily output at a certain factory is $Q(L) = 900L^{1/3}$ units, where L denotes the size of the labor force measured in worker-hours. Currently, 1000 worker-hours of labor are used each day. Use calculus to estimate the number of additional worker-hours of labor that will be needed to increase daily output by 15 units.

3. Find the intervals of increase and decrease and the relative extremes of the function $f(x) = x^3 + 2x^2 - x + 1$ and sketch the graph.

4. An efficiency study of the morning shift at a factory indicates that an average worker who arrives on the job at 8:00 A.M. will have produced $Q(t) = -t^3 + 9t^2 + 12t$ units t hours later. At what during the morning is the worker performing most efficiently?

5. Find $\int \dfrac{1}{\sqrt{4x^2 - 9}}\, dx$.

6. Find the second derivative of the function $f(x) = xe^{x^2}$.

7. Determine the interval of convergence of the series $\displaystyle\sum_{n=0}^{\infty}\left(\dfrac{2}{3}\right)^n (2x - 1)^n$.

8. Evaluate $\displaystyle\lim_{x \to 1} \dfrac{x^2 + x - 2}{x - 1}$.

9. Let $x^3 \ln y + 6x^2 y^2 + 6y \ln x - 5y^2 - 4y + 3 = 0$. Find the derivative of $\dfrac{dy}{dx}$ at the point $(1, 1)$.

10. Suppose that y satisfies the equation $\dfrac{dy}{dx} = x\sqrt{x^2 + 1}$ with the initial value $y(0) = 1$. Find the solution of y.