

Lecture 16 Worksheet (ECON211), AY 2025-26 [Date: 28 Aug 2025]

1. If $f(x) = \sqrt{x}$ and $g(x) = x^3 + 4x + 2$, then find $(f^{-1})'(2)$ and $(g^{-1})'(7)$ using the formula:

$$(f^{-1})'(a) = \frac{1}{f'(f^{-1}(a))}$$

2. Let $f(x) = x^2$ and $g(x) = x^3 - 3x$. Indicate whether $f(x)$ and $g(x)$ are increasing or decreasing functions. Also, determine whether these functions are convex or concave.

3. Find and classify the stationary points for the following functions: a) $-x^3 + 3x + 1$, and b) $x^4 - 6x^2 + 5$.

4. The weekly market demand for *Ruinmytrip*'s product is determined to be $p = 100 - 2q$. The total cost is $TC(q) = 50 + 2q$. Set up the profit function and determine the profit-maximizing quantity for *Ruinmytrip*.