

Brief answer to selected problems in Homework 08

1. Section 4.5:

problem 80: $a = -2$, $b = -\frac{8}{3}$.

problem 84(c): Answer = 1.

problem 86: Solve for $\frac{d}{dx}x^{\frac{1}{x}} = 0$, one gets $x^{\frac{1}{x}} \frac{1-n \ln x}{x^{n+1}} = 0$. So the only critical point is $x = e^{\frac{1}{n}}$. Next show that $x = e^{\frac{1}{n}}$ is indeed a maximum by first derivative test. Answer: Maximum = $e^{\frac{1}{ne}}$.

2. Section 4.6:

problem 12: maximize $V(y) = \frac{1}{3}\pi(9 - y^2)(3 + y)$ on $0 \leq y \leq 3$. It is easier to calculate than using $V(x)$.

problem 48: Similar to Example 4. Minimize $t = \frac{\sqrt{a^2 + x^2}}{c} + \frac{\sqrt{b^2 + (d - x)^2}}{c}$ with respect to x ,