

## Brief answer to selected problems in Homework 08

1. Section 4.4:

The last problem should be problem 111, not problem 11. See the textbook for solutions.

2. Section 4.5:

problem 80:  $a = -2, b = 0$ .

problem 84(c): Answer = 1.

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

3. 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  $x$ ,

problem 60: Check (a) by direct differentiation. Similar for (b).