

Homework problems for sections 7.3, 7.4, 7.5

Math 104, Spring 2007

Credit is given only if you choose the correct answer *and* show supporting work. No partial credit is given.

1. By calculating the derivative of the function

$$f(x) = \sqrt[x]{x},$$

(with $x > 0$), determine for which value of x this function attains its maximum value.

- A.) $x = \frac{1}{e}$ B.) $x = 1$ C.) $x = \frac{\pi}{2}$ D.) $x = 2$ E.) $x = e$ F.) $x = \pi$

2. Simplify

$$\sec(\sin^{-1} x).$$

A.) x B.) $\frac{1}{x}$ C.) $\sqrt{1-x^2}$ D.) $\frac{1}{\sqrt{1-x^2}}$ E.) $\frac{\sqrt{1-x^2}}{x}$ F.) $\frac{x}{\sqrt{1-x^2}}$

3. Evaluate

$$\int_0^{\sqrt{2}/2} \frac{t^2}{\sqrt{1-4t^6}} dt.$$

- A.) $\pi/2$ B.) $\pi/3$ C.) $\pi/4$ D.) $\pi/6$ E.) $\pi/12$ F.) $\pi/24$