

Quiz 10

Write your answers on this page. Continue on the back if you need more space.

(5 pts) 1. Find the following definite integral.

$$\int_1^4 \frac{x^2 - \sqrt{x}}{x} dx$$

$$= \int_1^4 \frac{x^2}{x} - \frac{\sqrt{x}}{x} dx = \int_1^4 x - x^{-1/2} dx$$

$$= \left[\frac{x^2}{2} - 2x^{1/2} \right]_1^4 = \frac{4^2}{2} - 2\sqrt{4} - \left(\frac{1}{2} - 2\sqrt{1} \right)$$

$$= 8 - 4 - \frac{1}{2} + 2 = 6 - \frac{1}{2} = \boxed{5.5}$$

(5 pts) 2. Simplify the following expression as a function of x for $0 < x < \frac{\pi}{2}$.

$$\frac{d}{dx} \int_0^x \tan t dt$$

By FTC ; $\frac{d}{dx} \int_0^x \tan(t) dt = \boxed{\tan(x)}$

Note