Your Name: ____________________________

You may use a calculator.

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1. Find

\[ \int \frac{(\ln(x))^3}{x} \, dx \]

- a) \((\ln(x))^4/4\)
- b) \((\ln(x))^4\)
- c) \(x^4/4\)
- d) \((\ln(x))^3\)

2. Find the average value of the function \(f(x) = x^4\) in the interval \([-1, 5]\).

- a) \(3126/5\)
- b) 127
- c) 46
- d) 521/5
3. Evaluate the Riemann sum for $n = 6$ with right end points to evaluate the area under $f(x) = e^x/x^2$ from $x = 1$ to $x = 4$.

- a) 6.80
- b) 15.21
- c) 2.35
- d) 8.65

4. Evaluate $\int_{1}^{5} x\sqrt{x-1}dx$.

- a) 20.24
- b) 18.13
- c) 18.5
- d) 28.74
5. The sales of a company in the first \( t \) years are given by \( S(t) = t\sqrt{0.2t^2 + 4} \) (in millions). Determine the **average sales** in the first 5 years of operation, that is from year zero to year four.

- a) 3.77
- b) 4.02
- c) 17.65
- d) 18.86.

6. Integrate \( \int \sqrt{\sin(x)} \cos(x)\,dx \).

- a) \((\cos(x))^{3/2}\)
- b) \(3(\sin(x))^{3/2}/2\)
- c) \(2(\sin(x))^{3/2}/3\)
- d) \(3(\cos(x))^{3/2}/2\)
7. Find the area enclosed by the curves $y = \sqrt{x}$ and $y = x^5$.

- a) $\frac{5}{12}$
- b) $\frac{1}{2}$
- c) $\frac{7}{12}$
- d) $\frac{4(-8 + \sqrt{2})}{3}$.

8. The number of commuters using the subway system is currently 100000. The management expects their number to **increase** according to the formula

$$N'(t) = 3000(1 + 0.4t)^{-1/2},$$

$t$ months from now. How many commuters will be using the subway system 6 months from now? Again $t$ varies from zero and therefore 6 months from now corresponds to $t = 5$

- a) 110981
- b) 120843
- c) 112659
- d) 109910
9. Find the area of the region enclosed by the curves \( y = \sqrt{x}, \ y = x - 2 \) and the y axis \( x = 0 \).

- a) 5
- b) 16/3
- c) 17/3
- d) \( 2 + 4\sqrt{2}/3 \)

10. Evaluate \( \int_{0}^{\pi/2} \frac{\cos(x)}{1 + \sin(x)} \, dx \)

- a) 0.75
- b) 0.52
- c) 0.69
- d) 1