

MATH 161 EXAM 3, Spring 2021

Show your work. No work no credit!		Name:	Score	
1.	Find the antiderivative of the following functions: a) $f(x) = x(6x - 1)$ .	b) $f(x) = \sqrt{2} + \sqrt{3x}$	1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
2.	Given, $f''(t) = 8t^5 + 1$ , $f(1) = 0$ , $f'(1) = 8$ , find: a) $f'(t)$ .	b) $f(t)$ .	9	
			10	
			Tot	
<p>In problems 3-7, find the given integrals. For indefinite integrals use substitution or integrate directly and differentiate to verify the answers.</p>				
3.	a) $\int \sqrt[4]{t^5} dt$	b) $\int_1^e \frac{1}{4x} dx$	Ans: _____.	
			Ans: _____.	
4.	a) $\int \frac{1 - \sqrt{y}}{y} dy$	b) $\int_0^{\pi/8} \sec(2t) \tan(2t) dt$	Ans: _____.	
			Ans: _____.	
5.	a) $\int \frac{4}{1 - t^2} dt$	b) $\int \frac{3x^2}{x^3 + 8} dx$	Ans: _____.	
			Ans: _____.	
Extra Space				

6. a)  $\int x\sqrt{1-x^2} dx$

Ans:\_\_\_\_\_.

b)  $\int xe^{1-x^2} dx$

Ans:\_\_\_\_\_.

7. a)  $\int_1^2 \frac{e^{1/x}}{x^2} dx$

Ans:\_\_\_\_\_.

b)  $\int \sinh^4 x \cosh x dx$

Ans:\_\_\_\_\_.

8. a) Compute  $\frac{d}{dx} \int_2^x \sqrt{1+t^3} dt$

Ans:\_\_\_\_\_.

b) Compute  $\frac{d}{dx} \int_x^2 t^4 \sin 2t dt$

Ans:\_\_\_\_\_.

9. A box with a square base and no lid must have a volume of  $32,000 \text{ cm}^3$ . Find the dimensions of the box that minimize the amount of material used.

Ans:\_\_\_\_\_.

10. From Quiz : Use Riemann sums to find the exact value of  $\int_0^4 (4x - x^2) dx$ .

Ans: Done.

Extra Space