Math 132 - Test 2

March 12, 2020

Name _____

Score _____

Show all work to receive full credit. Supply explanations where necessary. Evaluate all integrals by hand.

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1. (10 points) Integrate: $\displaystyle\int_0^{\pi/2} 7\sin^3\theta\,\cos^4\theta\,d\theta$

2. (8 points) Integrate: $\displaystyle\int \cos^{-1} x\,dx.$

3. (10 points) Integrate: $\int 5x^3 e^{2x}\, dx$

4. (6 points) After making the trigonometric substitution $x = 6\sec\theta$, you evaluated an integral and obtained $\theta + \cot\theta + C$. Resubstitute and write your result in terms of the variable x.

5. (6 points) Use a product-to-sum formula to evaluate the following integral.

$$\int \cos(3x)\,\cos(7x)\,dx$$

6. (8 points) Integrate: $\displaystyle\int \frac{(\ln x)^2}{x}\,dx$

7. (8 points) Integrate: $\int \sec^6 8y \tan 8y \, dy$

8. (8 points) In the following integral, carry out the appropriate trigonometric substitution, simplify the integrand, and then stop. Do not evaluate the new integral.

$$\int \frac{\sqrt{4-25x^2}}{x} \, dx$$

9. (10 points) Integrate: $\displaystyle\int \frac{dx}{\sqrt{1+9x^2}}$

10. (6 points) Integrate: $\displaystyle\int \cos^3 x\, dx$

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You must work individually on the following problems. They are due by 7:35am on Tuesday, March 24.

11. (7 points) Integrate: $\displaystyle\int \sqrt{25 - 4x^2}\, dx$.

12. (3 points) Write the form of the partial fraction decomposition of $\dfrac{x}{x^3(x^2+9)^2(2x+1)}$. Do not solve for the undetermined coefficients.

13. (10 points) Integrate: $\displaystyle\int \frac{2x^3 - 4x^2 - 15x + 5}{x^2 - 2x - 8}\, dx$
(Use a PFD.)