Exam 3 Review

MATH 142 Summer '18

Sections 5.8, 6.1-6.5

1. Evaluate $\int_0^1 x^9 + 45x \, dx$. Show your work.

2. Evaluate $\int x^8 \sqrt{x^9 + 8} \, dx$. Show your work.

3. Estimate $\int_0^3 e^x \, dx$ using left-hand and right-hand sums with $n = 6$ subintervals.

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4. Calculate $\frac{dy}{dx}$ given $y^7 + x^2 e^y = 0$. Show your work.

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5. Find the average value of $f(x) = \dfrac{3}{x}$ over $[2, 17]$. Show your work.

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6. Two ships start at the same point. One begins traveling north at a speed of 15 mph and the other ship heads east at a speed of 60 mph. At what rate is the distance between thhe ships changing after 2 hours. Show your work.

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7. Write down as many of the 8 properties of definite integrals as you can.

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8. Write down the fundamental theorem of calculus, part 1. Give an example problem showing how it could be used.

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9. Write down the fundamental theorem of calculus, part 2. Give an example problem showing how it could be used.

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10. Find $f(x)$ if $f'(x) = e^{-x} + 3x^5$ and $f(0) = 17$.

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11. In your own words, write down what you think an antiderivative is.

12. Which regions of a function contribute to negative area and which regions contribute to positive area in the area interpretation of the definite integral?

13. Let the velocity of a particle be given by $v(t) = \frac{1}{t^3} + 33$ ft/s. Find the distance traveled between $t = 1$ second and $t = 6$ seconds.

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14. Evaluate $\int \frac{4x+20}{(x^2+10x+45)^{\frac{5}{2}}}\,dx$

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15. Use left and right riemann sums to estimate the integral of x^2 on the interval $[0,1]$ with $n = 4$ subintervals.