CHAPTER 8 EXAM

Instructions. Solve 8 of the following 9 problems and write your solutions clearly, showing all work necessary for your solution. **Clearly indicate which problem you are skipping** (you must chose one to skip). A correct solution without supporting work may receive little or no credit. Clearer work will generally earn more points than work that is hard to read. You are allowed to use course resources: books, class notes, worksheet solutions, course videos, etc. You are allowed to use Desmos to help visualize the curves in the problems. However, you should **evaluate all integrals without a calculator or computer** (in part because you'll need to show your work). Solutions should not be simplified (I don't expect you to calculate $13600(9.8)$ or $17^{3/2}$, but those are perfectly good numbers as written). **You may not collaborate with other people**; everything you turn in should be your own work an no one else's.

1. Evaluate the integral: $\displaystyle\int \tan x \sec^3 x \ dx$

2. Evaluate the integral: $\displaystyle\int 6x^2 \sin^2(x^3) \ dx$

3. Evaluate the integral: $\displaystyle\int \frac{1}{(16 - x^2)^{3/2}} \ dx$

4. Evaluate the integral: $\displaystyle\int \frac{x^2 - x - 3}{(x - 1)(x^2 + 2)} \ dx$

5. Evaluate the integral: $\displaystyle\int x^{258} \ln x \ dx$

6. Evaluate the integral: $\displaystyle\int_0^1 x^3 e^{(x^2)} \ dx$

7. Evaluate the integral (or show that it is divergent): $\displaystyle\int_0^2 \frac{1}{(2 - x)^5} \ dx$

8. Determine if the integral converges or diverges: $\displaystyle\int_7^\infty \frac{2x}{1 + x^5} \ dx$. There is no need to evaluate the integral, but your conclusion must be clearly supported by your work. Make comparisons (of any kind) clear.

9. Determine if the integral converges or diverges: $\displaystyle\int_1^\infty \frac{1}{1 - x + 2x^3} \ dx$. There is no need to evaluate the integral, but your conclusion must be clearly supported by your work. Make comparisons (of any kind) clear.

Date: October 8-10, 2020.