

## Fianl Exam

Jan 12, 2016, 10:10AM

1. (about 10 pts) Find the solutions for linear differential equations and/or separable differential equations.
2. (about 10 pts) Find the volume and surface area of the object obtained by rotating some region around the  $x$  axis or the  $y$  axis.
3. (about 10 pts) Order several elementary functions from slowest to fastest growing rate as  $x \rightarrow \infty$  or  $x \rightarrow 0^+$ . Explain.
4. (about 10 pts) Write down the form of partial fraction expansion for  $\frac{P(x)}{Q(x)}$ , where  $P$ ,  $Q$  are polynomials with  $\deg P < \deg Q$ . (what if  $\deg P \geq \deg Q$ ? ).
5. (about 60 pts) Evaluate all sorts of integrals. For example, those in problems 69-113 on p509. At least one problem for each techniques in section 8.1-8.4.
6. (about 30 pts) A few problems from Midterm 01 and Midterm 02.