Review for Exam 3
Class 31: Wednesday April 16

Separation of Variables for IVPs
What is an IVP?
What is a solution to an IVP?
How do you check a solution to an IVP is correct?
Can you always use separation of variables to solve an IVP?
Write down an example of an IVP which you can't solve using separation of variables

Improper Integrals
What makes an integral "improper"?
How many different types of improper integrals are there?
How do you evaluate them?

Evaluating Improper Integrals without antidifferentiating
To show that an improper integral **CONVERGES** you have to show that it is _____ another improper integral which **CONVERGES**.
To show that an improper integral **DIVERGES** you have to show that it is _____ another improper integral which **DIVERGES**.

Limits
What is a limit?
What do you do when you have a limit which look like it is $\infty \cdot 0$ or $\frac{\infty}{\infty}$ or $\frac{0}{0}$?
Write down an example

Infinite Series
What's the difference between an infinite series and an improper integral?
What's the difference between an infinite series and an infinite sequence?
What is an infinite sequence?
What are the **terms** of an infinite series?
What are the **partial sums** of an infinite series?
What is the **sum** of an infinite series? What must be true for an infinite series to converge?
What must be true for a geometric series $\sum_{k=0}^{\infty} ar^k$ to converge? Write down an example of a convergent series and an example of a divergent series and explain how you know it is convergent/divergent.

Taylor Series
Are all Taylor Series infinite series? Are all infinite series Taylor series?
Are all Taylor Series power series? Are all power series Taylor series?
What's the difference between a Taylor series and a Taylor polynomial?
Write down an example of a Taylor series you know (what information do you need to have in order to compute a Taylor series?)