As a bare minimum, for the midterm exam you should:[1]

1) understand basic language of differential equations (DE, IC, IVP, order, implicit / explicit / general / particular solution, etc.);
2) be able to distinguish a linear equation;
3) understand concepts of direction field, phase portrait, autonomous equation, terminal value of the unknown function, be able to sketch solution to an IVP on the direction field;
4) solve first order separable DE and IVP;
5) solve first order linear DE and IVP;
6) be able to write down first or second order DE IVP which models certain physical process (gravitation, cooling/warming, population dynamics, etc.) *and* be able to solve first order DE IVPs;
7) be able to recognise and solve exact (and almost exact) DEs;
8) understand Euler's method and be able to compute $n \leqslant 5$ steps to estimate the solution to an IVP;

[1] As of 2nd February 2026. This list will be expanding as we cover new topics.