## MATH 246 Groupwork 2.4

Name:

1. Find and factor the characteristic polynomials for each of the following:
(a) $y^{\prime \prime}-y^{\prime}-20 y=0$
(b) $y^{\prime \prime \prime}+8 y^{\prime \prime}+16 y^{\prime}=0$
2. Find a fundamental set of solutions for each of the following, then write down the general solution.
(a) $2 y^{\prime \prime}+5 y^{\prime}-12 y=0$
(b) $D^{5} y+2 D^{4} y+6 D^{3} y=0$
3. Solve the initial value problem

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y^{\prime \prime}-2 y^{\prime}+y=0 \text { with } y(0)=-1 \text { and } y^{\prime}(0)=2
$$

4. Describe as best you can the behavior of the function $y=2 e^{-5 t}-6 e^{2 t}$. Specifically what happens as $t \rightarrow \infty$, as $t \rightarrow-\infty$ and for $t$ near 0 ?
