King Fahd Univ. of Petroleum and Minerals
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MAJOR No. 2
(MATH. 202-062 Section 6)

Name:

ID:
Prob. 1
Is the set of functions $f_1(x) = e^{x+2}$, $f_1(x) = e^{x-3}$ linearly dependent or linearly independent on $(-\infty, +\infty)$? Discuss!
Prob. 2
Use reduction of order technique to find a second solution \( y'' + 2y' + y = 0 \):
\[ y_1 = xe^{-x}. \]
Prob. 3
Find the general solution of \( y''' + 6y'' + y' - 34y = 0 \) if it is known that \( y_1 = e^{-4x} \cos x \) is one solution.
Prob. 4
Solve using the annihilator approach \( y^{(4)} - 4y'' = 5x^2 - e^{2x} \).
Prob. 5
Solve the third-order differential equation $y'''+4y' = \sec 2x$