

MATH 0190

Quiz 5. Solution.

1.  $f''(x) + 5f(x) = 4f'(x)$ .

The characteristic equation is  $\lambda^2 - 4\lambda + 5 = 0$ .  ~~$\lambda = 1 \pm 2i$~~

$\lambda = 2 \pm i$ .

$$f(x) = Ae^{2x} \cos x + Be^{2x} \sin x.$$

$\therefore f(0) = 1$ .

$\therefore f(0) = A \cdot \cos 0 + B \cdot 0 = A = 1$ .

So  $f(x) = e^{2x} \cos x + B e^{2x} \sin x$ .  
B can be any real number.