

RMF úkol č. 7

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1 př č. 4

$$a \in \mathbb{R}; L = \frac{d^2}{dx^2} + a$$

$$L\epsilon = \delta$$

$$\epsilon = ?$$

$$\mathcal{F}[f(x)](\xi) = \tilde{f}(\xi)$$

$$\mathcal{F}[Lf](\xi) = (i\xi)^2 \tilde{f}(\xi) + a\tilde{f}(\xi) = -\xi^2 \tilde{f}(\xi) + a\tilde{f}(\xi) = \mathcal{F}[\delta(x)](\xi) = 1$$

$$\tilde{f}(\xi) = \frac{1}{-\xi^2 + a} = \frac{1}{2}\sqrt{a}\frac{1}{-\xi + \sqrt{a}} + \frac{1}{2}\sqrt{a}\frac{1}{\xi + \sqrt{a}}$$

$$\mathcal{F}[\Theta'(x)](\xi) = \mathcal{F}[\delta(x)](\xi) = 1(\xi) = \xi \mathcal{F}[\Theta(x)](\xi)$$

$$\mathcal{F}[\Theta(x)](\xi) = \frac{1}{\xi}$$

$$\mathcal{F}^{-1}\left[\frac{1}{\xi + A}\right](x) = e^{ixA}\Theta(x)$$

$$f(x) = \frac{1}{2\sqrt{a}}e^{ix\sqrt{a}}\Theta(-x) + \frac{1}{2\sqrt{a}}e^{ix\sqrt{a}}\Theta(x) = \frac{1}{2\sqrt{a}}e^{ix\sqrt{a}}(\Theta(-x) + \Theta(x)) = \frac{1}{2\sqrt{a}}e^{ix\sqrt{a}}$$