Quiz 7 **Name:** _____

MATH 3150, Section 004 April 10, 2019

For all the following multiple-choice questions, circle your answers clearly. No partial credit will be awarded; any scratch work will be ignored.

1. Let $f(x)$ have Fourier transform $\mathcal{F}[f] = F(\omega)$. Which of the following is the correct Fourier representation for $\frac{\mathrm{d}f}{\mathrm{d}x} = f'(x)$?

(a) $F(\omega)$

(b) $-i\omega F(\omega)$

(c) $F'(\omega)$

(d) $F^2(\omega)$

(e) $\sqrt{F(\omega)}$

2. Which of the following statements does **not** characterize the Fourier Transform?

(a) It is the analogue of a Fourier Series on an unbounded domain.

(b) It involves an integral that can never be evaluated explicitly.

(c) It is defined as an integral over an unbounded domain.

(d) It reveals frequency content of a function.

(e) The Fourier Transform is a linear operation.

3. Which of the following is **not** a duality property with the Fourier Transform?

(a) Shifting a function in one domain is multiplication by a complex exponential in the other.

(b) Addition of two functions in one domain is multiplication in the other domain.

(c) Differentiating in one domain is multiplication by ω or x in the other.

(d) Multiplication of two functions in one domain is convolution in the other domain.