Worksheet # 10

MATH 3160 – Complex Variables
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Problem 1

Use the Taylor series of $\sin(z)$, $\cos(z)$, and e^z at $z = 0$ to prove Euler's formula:

$$e^{iz} = \cos(z) + i\sin(z)$$

Problem 2

Find $f^{(10)}(3)$ for $f(z)$ as given below. You can leave the answer in terms of powers, factorials, etc.

Problem 3

List the first four nonzero terms of the Taylor series for $f(z) = \cos(3z + 2)$ centered at $z = -\frac{2}{3}$.
