Problem 2

In each of Problems 1 through 6, use Euler’s formula to write the given expression in the form $a + ib$.

$\exp(2 - 3i)$

Solution

Euler’s formula states that $e^{ix} = \cos x + i \sin x$. Split up the exponential function first and then use the formula.

$\exp(2 - 3i) = e^{2-3i}$

$= e^2 e^{-3i}$

$= e^2 [\cos(-3) + i \sin(-3)]$

$= e^2 (\cos 3 - i \sin 3)$

$= e^2 \cos 3 - i e^2 \sin 3$

$\approx -7.32 - 1.04i$