

## 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.

$$\begin{aligned}\exp(2 - 3i) &= e^{2-3i} \\ &= e^2 e^{-3i} \\ &= e^2 [\cos(-3) + i \sin(-3)] \\ &= e^2 (\cos 3 - i \sin 3) \\ &= e^2 \cos 3 - ie^2 \sin 3 \\ &\approx -7.32 - 1.04i\end{aligned}$$