

## Problem 4

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

$$e^{2-(\pi/2)i}$$

---

### Solution

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

$$\begin{aligned} e^{2-(\pi/2)i} &= e^2 \exp\left(-i\frac{\pi}{2}\right) \\ &= e^2 \left[ \cos\left(-\frac{\pi}{2}\right) + i \sin\left(-\frac{\pi}{2}\right) \right] \\ &= e^2 \left[ \cos\left(\frac{\pi}{2}\right) - i \sin\left(\frac{\pi}{2}\right) \right] \\ &= e^2[0 - i(1)] \\ &= -e^2i \\ &\approx -7.39i \end{aligned}$$