

## Problem 2

In each of Problems 1 through 4, write the given expression as a product of two trigonometric functions of different frequencies.

$$\sin 7t - \sin 6t$$

---

### Solution

Recall the sum-to-product formula,

$$\sin u - \sin v = 2 \cos \left( \frac{u+v}{2} \right) \sin \left( \frac{u-v}{2} \right).$$

Using this, the given expression becomes

$$\begin{aligned} \sin 7t - \sin 6t &= 2 \cos \left( \frac{7t+6t}{2} \right) \sin \left( \frac{7t-6t}{2} \right) \\ &= 2 \cos \frac{13t}{2} \sin \frac{t}{2}. \end{aligned}$$