

Exercise 1

In Exercises 1–2, find a period of the given function and sketch its graph.

- (a) $\cos x$,
- (b) $\cos \pi x$,
- (c) $\cos \frac{2}{3}x$,
- (d) $\cos x + \cos 2x$.

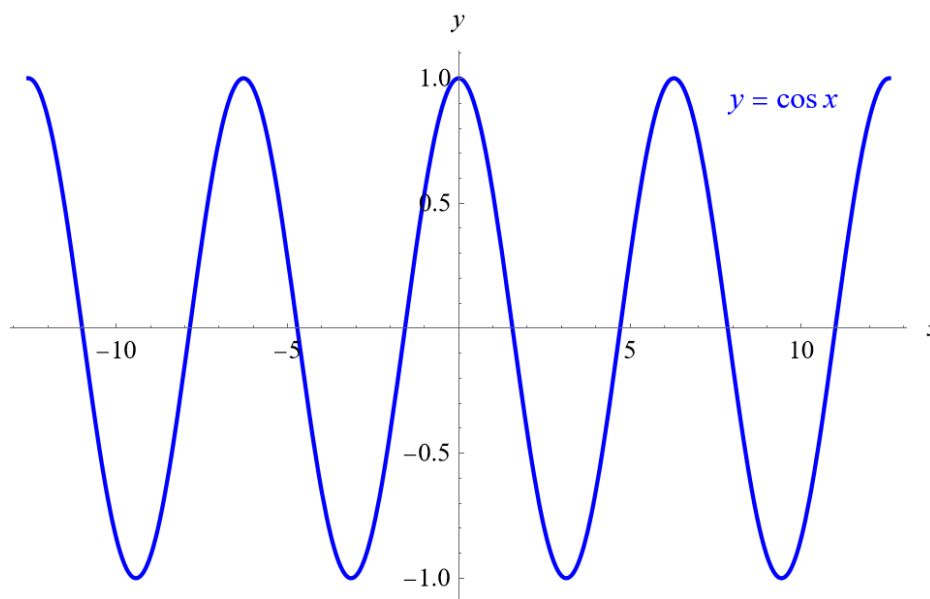
Solution

Part (a)

The period of $\cos x$ is

$$T = \frac{2\pi}{1} = 2\pi.$$

Below is a graph of $\cos x$ versus x . Notice that the graph repeats itself every 2π units.

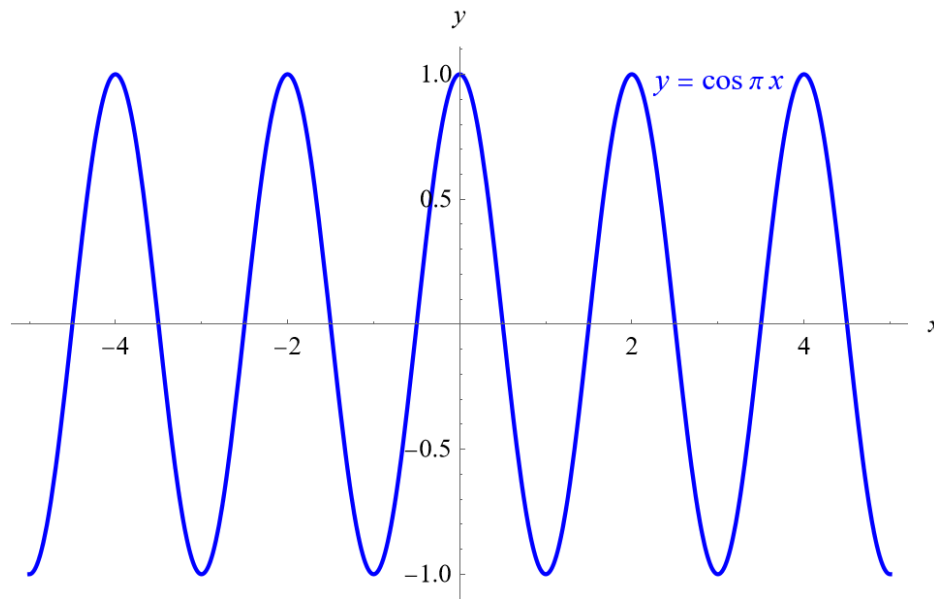


Part (b)

The period of $\cos \pi x$ is

$$T = \frac{2\pi}{\pi} = 2.$$

Below is a graph of $\cos \pi x$ versus x . Notice that the graph repeats itself every 2 units.

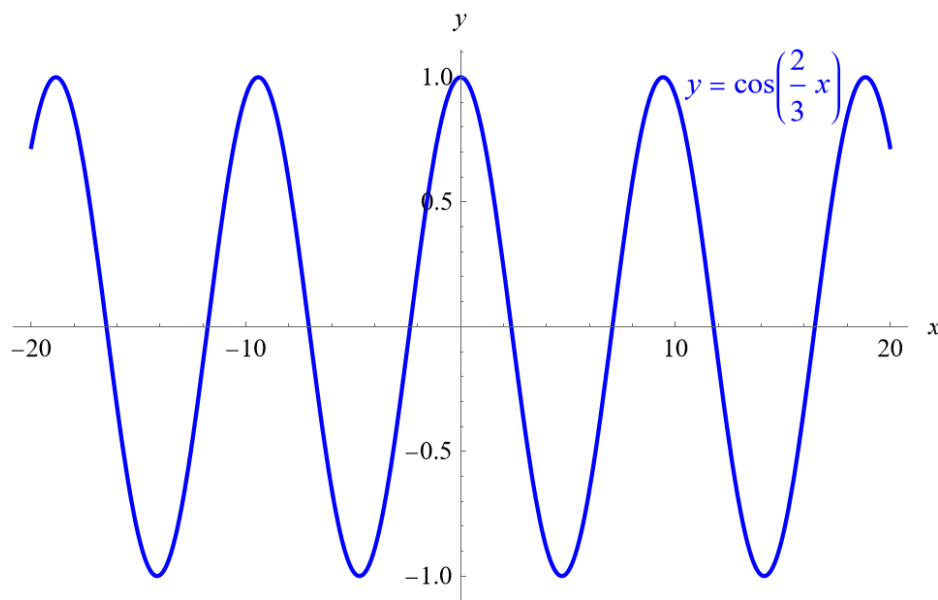


Part (c)

The period of $\cos \frac{2}{3}x$ is

$$T = \frac{2\pi}{\frac{2}{3}} = 3\pi.$$

Below is a graph of $\cos \frac{2}{3}x$ versus x . Notice that the graph repeats itself every 3π units.



Part (d)

The period of $\cos x$ is $\frac{2\pi}{1} = 2\pi$, and the period of $\cos 2x$ is $\frac{2\pi}{2} = \pi$. The least common multiple of 2π and π is 2π , so this is the period of $\cos x + \cos 2x$.

