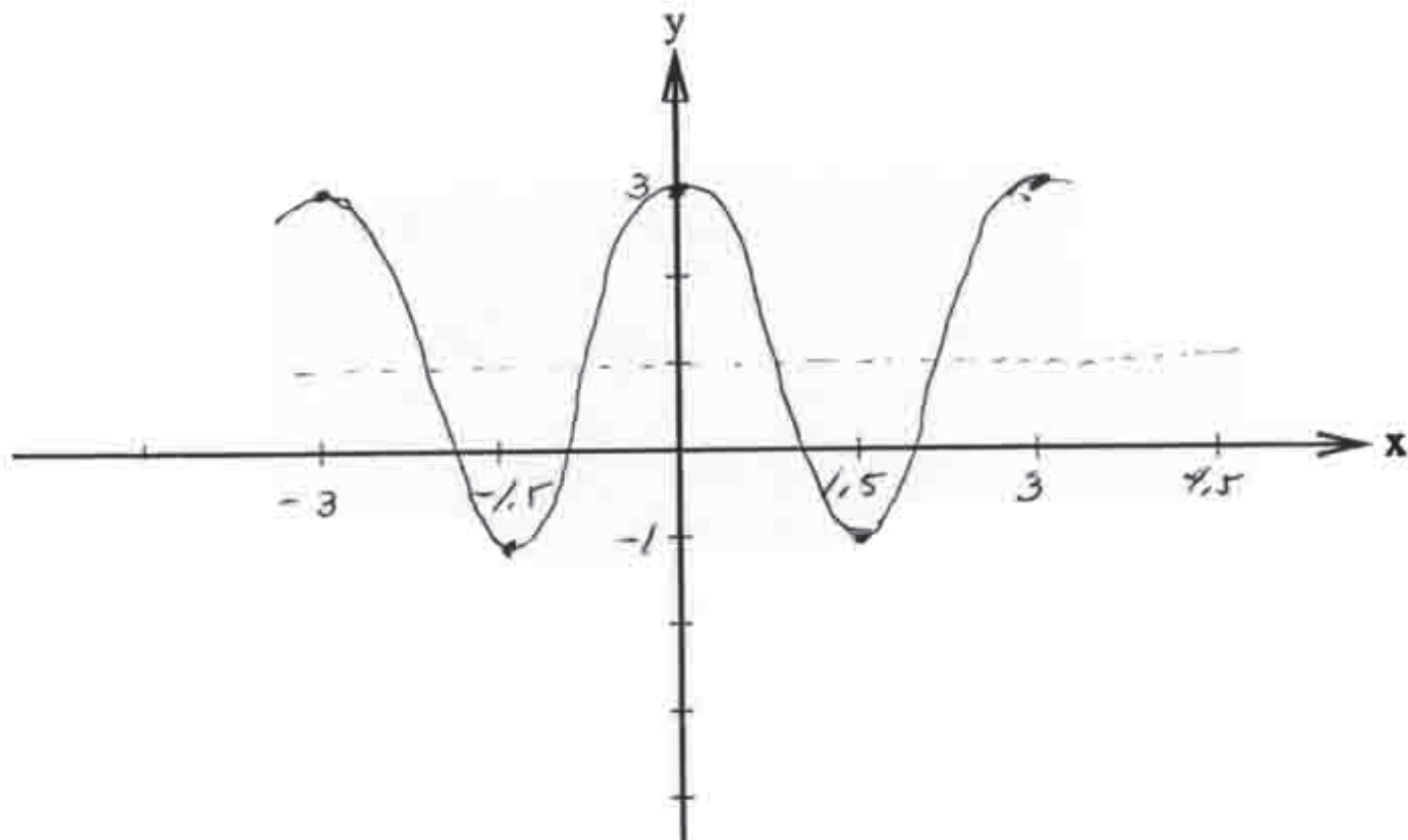


7. (10 pts.) On the axes provided below, sketch at least two full periods of the graph of the trigonometric function

$$f(x) = 1 + 2 \cos\left(\frac{2\pi}{3}x\right).$$

Be sure to indicate the choice of units on each axis.



(b) What are the amplitude and period of  $f$ ?

Amplitude = 2

Period = 3

(c) Find a formula for the function  $g$  whose graph is obtained by shifting the graph of  $f$  down by two units and to the right by two units.

$$g(x) = \underline{-1 + 2 \cos\left(\frac{2\pi}{3}(x-2)\right)}$$

(d) Find a formula for the trigonometric function,  $k$ , whose graph has all of the following features

- the same midline and amplitude as  $f$ ,
- twice as many peaks and valleys as  $f$ , and
- at least one of its peaks coincides with a peak of  $f$ .

$$k(x) = \underline{1 + 2 \cos\left(\frac{4\pi}{3}x\right)}$$