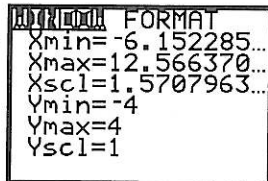
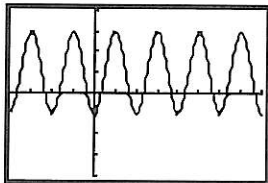


Step 4. Adjust the viewing window using the **WINDOW** menu. In this case it would be wise to select the correct set of x values.



Finally use **GRAPH** to display the graph.



EXERCISES 10.3

1. State the period of the following functions

(a) $f(x) = \sin \frac{1}{2}x$

(b) $f(x) = \cos 3x$

(c) $f(x) = \tan \frac{x}{3}$

(d) $g(x) = \cos\left(\frac{x}{2} - \pi\right)$

(e) $g(x) = 4 \sin(\pi x + 2)$

(f) $g(x) = 3 \tan\left(\frac{\pi}{2} - 2x\right)$

2. State the amplitude of the following functions

(a) $f(x) = 5 \sin 2x$

(b) $g(x) = -3 \cos \frac{x}{2}$

(c) $g(x) = 4 - 5 \cos(2x)$

(d) $f(x) = \frac{1}{2} \sin(3x)$

3. Find the period and, where appropriate, the amplitude of the following functions.

(a) $y = 2 \sin x$

(b) $y = 3 \cos \frac{x}{3}$

(c) $y = 3 \tan x$

(d) $2 \tan(x - 2\pi)$

(e) $y = -4 \sin\left[2\left(x + \frac{\pi}{6}\right)\right] + 1$

(f) $y = 2 - 3 \cos(2x - \pi)$

(g) $y = -2 \tan \frac{x}{6}$

(h) $y = \frac{1}{4} \cos\left[3\left(x - \frac{3\pi}{4}\right)\right] + 5$

(i) $y = 4 \tan\left(\frac{x-4}{3}\right) - 3$

(j) $y = -\frac{2}{3} \cos\left(\frac{3}{4}\left(x + \frac{3\pi}{5}\right)\right) + 5$

4. Sketch the graph of the curve with equation given by

(a) $y = 3 \cos x, 0 \leq x \leq 2\pi$

(b) $y = \sin \frac{x}{2}, -\pi \leq x \leq \pi$

(c) $y = 2 \cos\left(\frac{x}{3}\right), 0 \leq x \leq 3\pi$

(d) $y = -\frac{1}{2} \sin 3x, 0 \leq x \leq \pi$

(e) $y = 4 \tan\left(\frac{x}{2}\right), 0 \leq x \leq 2\pi$

(f) $y = \tan(-2x), -\pi \leq x \leq \frac{\pi}{4}$

(g) $y = \frac{1}{3} \cos(-3x), -\frac{\pi}{3} \leq x \leq \frac{\pi}{3}$

(h) $y = 3 \sin(-2x), -\pi \leq 0 \leq \pi$

5. Sketch the graph of the curve with equation given by

(a) $y = 3 \cos x + 3, 0 \leq x \leq 2\pi$

(b) $y = \sin \frac{x}{2} - 1, -\pi \leq x \leq \pi$

(c) $y = 2 \cos\left(\frac{x}{3}\right) - 2, 0 \leq x \leq 3\pi$

(d) $y = -\frac{1}{2} \sin 3x + 2, 0 \leq x \leq \pi$

(e) $y = 4 \tan\left(\frac{x}{2}\right) - 1, 0 \leq x \leq 2\pi$

(f) $y = \tan(-2x) + 2, -\pi \leq x \leq \frac{\pi}{4}$

(g) $y = \frac{1}{3} \cos(-3x) + \frac{1}{3}, -\frac{\pi}{3} \leq x \leq \frac{\pi}{3}$

(h) $y = 3 \sin(-2x) - 2, -\pi \leq 0 \leq \pi$

6. Sketch the graph of the curve with equation given by

(a) $y = 3 \cos\left(x + \frac{\pi}{2}\right), 0 \leq x \leq 2\pi$

(b) $y = \sin\left(\frac{x}{2} - \pi\right), -\pi \leq x \leq \pi$

(c) $y = 2 \cos\left(\frac{x}{3} + \frac{\pi}{6}\right), 0 \leq x \leq 3\pi$

(d) $y = -\frac{1}{2} \sin(3x + 3\pi), 0 \leq x \leq \pi$

(e) $y = 4 \tan\left(\frac{x}{2} - \frac{\pi}{4}\right), 0 \leq x \leq 2\pi$

(f) $y = \tan(-2x + \pi), -\pi \leq x \leq \frac{\pi}{4}$

(g) $y = \frac{1}{3} \cos(-3x - \pi), -\frac{\pi}{3} \leq x \leq \frac{\pi}{3}$

(h) $y = 3 \sin\left(-2x - \frac{\pi}{2}\right), -\pi \leq 0 \leq \pi$

7. Sketch graphs of the following functions for x values in the interval $[-2\pi, 2\pi]$.

(a) $y = \sin(2x)$

(b) $y = -\cos\left(\frac{x}{2}\right)$

(c) $y = 3 \tan\left(x - \frac{\pi}{4}\right)$

(d) $y = 2 \sin\left(x - \frac{\pi}{2}\right)$

(e) $y = 1 - 2 \sin(2x)$

(f) $y = -2 \cos\left(\frac{x - \pi}{2}\right)$

(g) $y = 3 \tan\left[\frac{1}{2}\left(x + \frac{\pi}{4}\right)\right] - 3$

(h) $y = 3 \cos\left(x + \frac{\pi}{4}\right)$

(i) $y = 2 \sin \left[\frac{1}{3} \left(x + \frac{2\pi}{3} \right) \right] - 1$

(j) $y = 3 \tan(2x + \pi)$

(k) $y = 4 \sin \left(\frac{x + \frac{\pi}{2}}{2} \right)$

(l) $y = 2 - \sin \left(\frac{2(x - \pi)}{3} \right)$

(m) $y = 2 \cos(\pi x)$

(n) $y = 2 \sin[\pi(x + 1)]$

- 8.**
- (a) i. Sketch one cycle of the graph of the function $f(x) = \sin x$.
- ii. For what values of x is the function $y = \frac{1}{f(x)}$ not defined?
- iii. Hence, sketch one cycle of the graph of the function $g(x) = \operatorname{cosec} x$.
- (b) i. Sketch one cycle of the graph of the function $f(x) = \cos x$.
- ii. For what values of x is the function $y = \frac{1}{f(x)}$ not defined?
- iii. Hence, sketch one cycle of the graph of the function $g(x) = \sec x$.
- (c) i. Sketch one cycle of the graph of the function $f(x) = \tan x$.
- ii. For what values of x is the function $y = \frac{1}{f(x)}$ not defined?
- iii. Hence, sketch one cycle of graph of the function $g(x) = \cot x$.