18.3 Exercises

Exercise 18.1

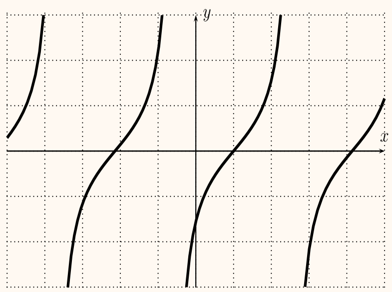
Graph the function and describe how the graph can be obtained from one of the basic graphs $y = \sin(x)$, $y = \cos(x)$, or $y = \tan(x)$.

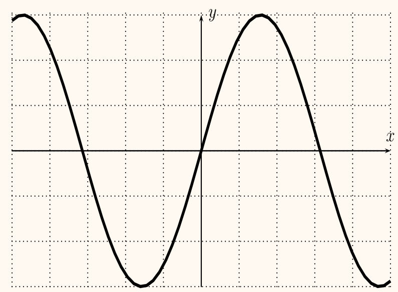
a) $f(x) = \sin(x) + 2$ b) $f(x) = \cos(x - \pi)$ c) $f(x) = \tan(x) - 4$
d) $f(x) = 5 \cdot \sin(x)$ e) $f(x) = \cos(2 \cdot x)$ f) $f(x) = \sin(x - 2) - 5$

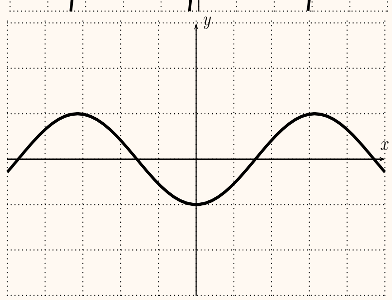
Exercise 18.2

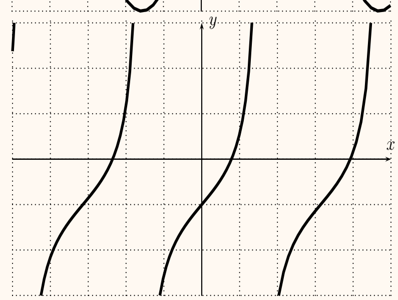
Identify the formulas with the graphs.

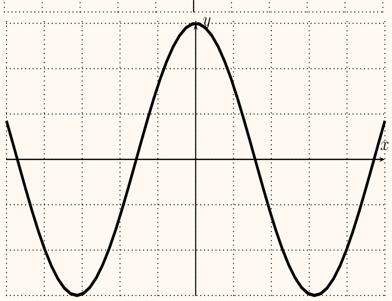
$$f(x) = \sin(x) + 2, \quad g(x) = \tan(x - 1), \quad h(x) = 3\sin(x)$$
$$i(x) = 3\cos(x), \quad j(x) = \cos(x - \pi), \quad k(x) = \tan(x) - 1$$

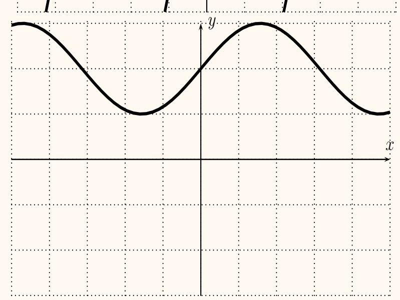
a) 

b) 

c) 

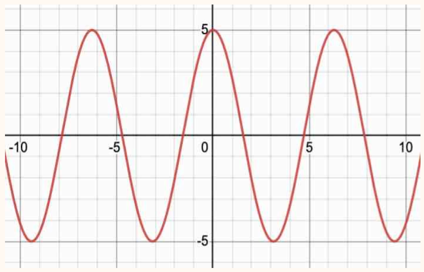
d) 

e) 

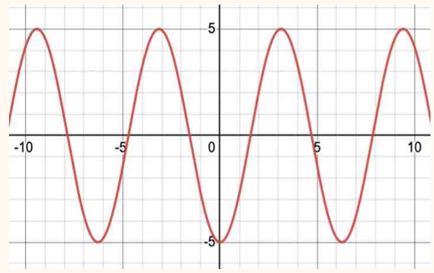
f) 

Exercise 18.3

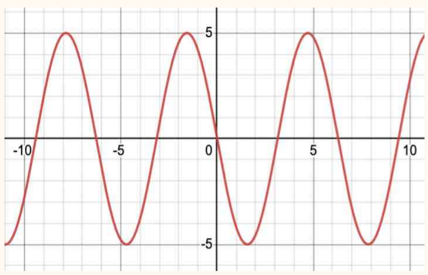
Find the formula of a function whose graph is the one displayed below.



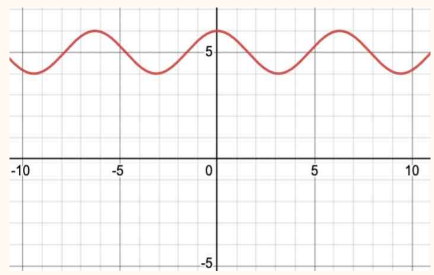
a)



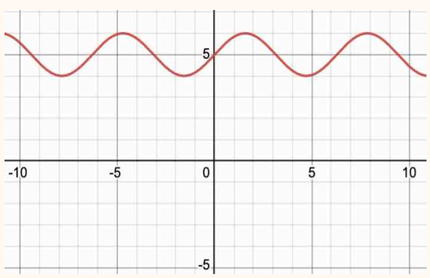
b)



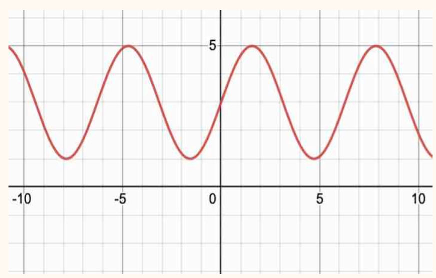
c)



d)



e)



f)

Exercise 18.4

Find the amplitude, period, and phase shift of the function.

a) $f(x) = 5\sin(2x + \pi)$ b) $f(x) = 3\sin(4x - \frac{\pi}{2})$
c) $f(x) = 4\sin(6x)$ d) $f(x) = 2\cos(7x + \frac{\pi}{4})$
e) $f(x) = 8\cos(2x - 3\pi)$ f) $f(x) = 3\sin(\frac{x}{4})$
g) $f(x) = -4\cos(5x + \frac{\pi}{3})$ h) $f(x) = 7\sin(\frac{1}{2}x - \frac{6\pi}{5})$
i) $f(x) = \cos(-2x)$ j) $f(x) = 6\cos(\pi x - \pi)$

Exercise 18.5

Find the amplitude, period, and phase shift of the function. Use this information to graph the function over a full period. Label all roots, maxima, and minima of the function.

a) $y = 5\cos(2x)$
b) $y = -4\sin(\pi x)$
c) $y = 4\sin(5x - \pi)$
d) $y = 6\cos(2x - \pi)$
e) $y = 5\sin(2x - \frac{\pi}{2})$
f) $y = 7\cos(3x - \frac{\pi}{2})$
g) $y = 5\sin(3x - \frac{\pi}{4})$
h) $y = 3\sin(4x + \pi)$
i) $y = 2\cos(5x + \pi)$
j) $y = 4\sin(2x + \frac{\pi}{2})$
k) $y = 3\cos(6x + \frac{\pi}{2})$
l) $y = 3\cos\left(2x + \frac{\pi}{4}\right)$
m) $y = 7\sin\left(\frac{1}{4}x + \frac{\pi}{4}\right)$
n) $y = -2\sin\left(\frac{1}{5}x - \frac{\pi}{10}\right)$
o) $y = \frac{1}{3}\cos\left(\frac{14}{5}x - \frac{6\pi}{5}\right)$