

1. Identify the amplitude, fundamental period and phase shift of the following functions:

$$f(x) = -\sin(\pi x + 3) - 1.$$

2. Take  $f$  to be a function with fundamental period equal to  $\frac{1}{2}$  and take  $g$  to be given by

$$g(x) = 7x + \pi.$$

Determine the fundamental period of  $f \circ g$ .

3. Graph the following function and identify the fundamental period, amplitude, domain and range.

$$f(x) = -\sin(\pi x + 3) - 1.$$

4. Calculate the following.

a)  $\cot\left(\frac{7\pi}{6}\right)$

b)  $\csc(\theta)$  given that  $\sin(\theta) = -\frac{1}{9}$

c)  $\arccos\left(-\frac{\sqrt{3}}{2}\right)$

d)  $\arcsin\left(-\frac{\sqrt{3}}{2}\right)$

e)  $\arctan(-\sqrt{3})$

5. Calculate the following.

a)  $\arccos\left(\cos\left(\frac{5\pi}{7}\right)\right)$

b)  $\arcsin\left(\sin\left(\frac{3\pi}{4}\right)\right)$

c)  $\arctan\left(\tan\left(\frac{5\pi}{3}\right)\right)$

d)  $\sin\left(\arctan\left(\frac{3}{5}\right)\right)$

6. Solve the following equations.

a)  $\cos(x) = -\frac{\sqrt{2}}{2}$  on  $[0, 2\pi)$

b)  $5 \sin(x) - \frac{5}{2} = 0$  on  $\mathbb{R}$

c)  $\cos^2(\theta) + \frac{3}{2} \cos(\theta) - 1 = 0$  on  $\mathbb{R}$

d)  $\tan(x) - \frac{2}{3} = 0$  on  $\mathbb{R}$

e)  $\cos(x) = -1.1$

7. A point  $(x, -\frac{3}{5})$  on the unit circle corresponds to an angle  $\theta$  in quadrant III. Calculate

$\sin(\theta)$ ,  $\cos(\theta)$ ,  $\tan(\theta)$ ,  $\csc(\theta)$ ,  $\cot(\theta)$ , and  $\sec(\theta)$ .