

## Part 2

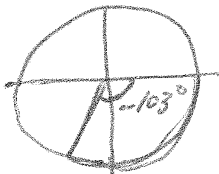
You must **SHOW ALL OF YOUR WORK** to receive credit. Please use box each final answer.

6. Answer to (a) – (e).

(5 pts each)

(a) Find the **reference angle** of  $-103^\circ$ .

$$180^\circ - 103^\circ = 77^\circ$$



(a) 77°

(b) Find the **phase shift** of  $y = 2 + 2\sin(2x + \pi)$ .

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

(b)  $-\frac{\pi}{2}$

(c) Find the **period** of  $y = -3\tan\left(\frac{\pi x}{6}\right)$ .

$$\text{period} = \frac{\pi}{\frac{\pi}{6}} = 6$$

(c) 6

(d) Find the **exact value** of  $\tan\left(\arctan\left(\frac{\pi}{5}\right)\right)$ .

Since  $y = \tan x$  and  $x = \arctan y$  are inverse of each other,  
 $\tan(\arctan x) = x$  and  $\tan\left(\arctan\left(\frac{\pi}{5}\right)\right) = \frac{\pi}{5}$ .

Also  $-\frac{\pi}{2} < \tan x < \frac{\pi}{2}$  and  $-\frac{\pi}{2} < \frac{\pi}{5} < \frac{\pi}{2}$ .

(d)  $\frac{\pi}{5}$

(e) Find the **exact value** of  $\cos(\cot^{-1}(-1))$ .

$$\text{Let } \cot^{-1}(-1) = \theta.$$

$$\text{Then } \cot \theta = -1. \quad \text{so } \theta = \frac{3\pi}{4}.$$

$$\cos\left(\frac{3\pi}{4}\right) = -\frac{\sqrt{2}}{2}.$$

$$\cos(\cot^{-1}(-1)) = -\frac{\sqrt{2}}{2}$$

(e)  $-\frac{\sqrt{2}}{2}$