

11. (5 points) For the function $y = -3 \cos\left(-\frac{\pi}{3}x + \pi\right) - 2$, determine:

$$= -3 \cos\left[-\frac{\pi}{3}(x-3)\right] - 2.$$

(a) (1 points) Domain = $(-\infty, +\infty)$

(b) (1 points): Amplitude = 3

(c) (1 points) Phase shift = 3

(d) (1 points) Period = $\left|\frac{2\pi}{-\frac{\pi}{3}}\right| = 6$

(e) (1 points) Range = $[-5, 1]$

$$-1 \leq \cos \theta \leq 1$$

$$-3 \leq -3 \cos \theta \leq 3$$

$$-5 \leq -3 \cos \theta - 2 \leq 1$$

↓
phase shift!

12. (5 points) Prove the identity step by step: $\frac{\sec x - \cos x}{\cos x} = \sec^2 x - 1$.

Proof: The left side = $\frac{\sec x - \cos x}{\cos x}$

$$= \frac{\sec x}{\cos x} - \frac{\cos x}{\cos x}$$

$$= \sec x \cdot \frac{1}{\cos x} - 1$$

$$= \sec^2 x - 1.$$

= right-hand side.

Q.E.D.