2. [16 points]

a. [4 points] The domain and range of the function \( y = f(x) \) are \([-2, 6) \) and \(( -\infty, -10], \) respectively. What is the domain and range of \( g(x) = 1 - f\left(\frac{1}{4}(x + 8)\right) \)?

Solution: Domain: \([-16, 16)\) Range: \([11, \infty)\)

b. [2 points] If \( f(x) = |x^3| \), then the function \( f(x) \) is (circle your answer)

Solution: EVEN ODD NEITHER

c. [2 points] Complete the following sentence:

Solution: If \( f(x) = 2^x \), then the graph of \( g(x) = f(x + 3) \) can be obtained by applying a vertical stretch by a factor of 8 to the graph of \( y = f(x) \).

d. [4 points] Find the equations of the vertical and horizontal asymptotes (if any) of the following functions. If a function does not have vertical or horizontal asymptotes write “None”.

Solution:

i) \( y = 3e^{-0.4x} - 2 \)

Vertical asymptote: None Horizontal asymptote: \( y = -2 \).

ii) \( y = 1 - 7\log(3x + 1) \)

Vertical asymptote: \( x = -\frac{1}{3} \) Horizontal asymptote: None

e. [2 points] Find two exact values of \(-\pi < \theta \leq \pi\), measured in radians, such that \( \cos \theta = \cos(A) \), where \( A = \frac{11}{5} \pi \) radians.

Solution: \( \theta = \frac{1}{5} \pi, -\frac{1}{5} \pi \).

f. [2 points] Let \( f(x) \) be a periodic function that has amplitude 4 and let \( g(x) = 3f(5x) \). Find the amplitude of the function \( g(x) \).

Solution: Amplitude of \( g(x) = 12 \)