

1. **Graphing:** For each of the following functions, give the domain. Find all x and y -intercepts and any asymptotes, if they exist. Find the derivative of the functions, then determine any maxima or minima. Give both the x and y values. Sketch the graph of the function.

a. $y = x + \frac{4}{x},$

b. $y = \frac{5x^2}{x+6}$

c. $y = 4(e^{-0.02x} - e^{-0.6x}),$

d. $y = (x+4)\ln(x+4),$

e. $y = \frac{2(x-4)}{x^2+9},$

f. $y = \frac{8(x-10)}{(1+0.05x)^3},$

2. Solve the following initial value problems from linear differential equations:

a. $\frac{dw}{dt} = 0.02w + 4, \quad w(0) = 2.$

b. $\frac{dx}{dt} = 3 - 0.1x, \quad x(0) = 4.$

c. $\frac{dy}{dt} = 2 + \frac{y}{3}, \quad y(0) = 2.$