 How to Find Derivatives Using First Principle :Here we are going to see how to find derivatives using first principleLet f be defined on an open interval I R containing the point x0, and suppose thatexists. Then f is said to be differentiable at x0 and the derivative of f at x0, denoted by f'(x0) , is given byFor a function y = f(x) defined in an open interval (a, b) containing the point x0, the left hand and right hand derivatives of f at x = hare respectively denoted by f'(h-) and f'(h+)f'(h-) = limh-> 0-[f(x + h) - f(x)] / hf'(h+) = limh-> 0+[f(x + h) - f(x)] / hprovided the limits exist.Question 1 :Find the derivatives of the following functions using first principle.Solution :(i) f(x) = 6f'(x) = lim h-> 0[f(x + h) - f(x)] / hf(x + h) = 6f'(x) = limh-> 0((6) - 6)/h = limh-> 0 (0/h) = 0(ii) f(x) = -4x + 7f'(x) = limh-> 0[f(x + h) - f(x)] / hf(x + h) = -4(x + h) + 7f'(x) = limh-> 0(-4(x + h) + 7 - (-4x + 7))/h= limh-> 0(-4x - 4h + 7 + 4x - 7)/h = limh-> 0(-4h/h) = -4(ii) f(x) = -x2 + 2f'(x) = limh-> 0[f(x + h) - f(x)] / hf(x + h) = -(x + h)2 + 2= - (x2 + h2 + 2xh) + 2= - x2- h2- 2xh + 2f'(x) = limh-> 0((- x2- h2- 2xh + 2) - (-x2 + 2))/h= limh-> 0(- x2- h2- 2xh + 2 + x2- 2)/h= limh-> 0(- h2- 2xh)/h= limh-> 0(- h- 2x) = -2xQuestion 2 :Find the derivatives from the left and from the right at x = 1 (if they exist) of the following functions. Are the functions differentiable at x = 1?(i) f(x) = |x - 1|Solution :If the function is differentiable, thenf'(1-) =f'(1+)f'(1-) = [f(x) - f(1)] / (x - 1)= [-(x - 1) - 0]/(x - 1)= -1f'(1+) = [f(x) - f(1)] / (x - 1)= [(x - 1) - 0]/(x - 1)= 1Hence the given function is not differentiable at x = 1. Kindly mail your feedback tov4formath@gmail.comWe always appreciate your feedback.

First principle of derivative. Derivatives using the first principle. Derivatives first principle rule.