Calculus for Machine Learning Sheet

1. When does the limit doesn't exist?
2. How can we use limits to get the derivative of a function?
3. How can we minimize (Round-off, Truncation, Underflow) errors when we are trying to get the derivative with code?
4. What is the derivative of these functions:
   - f(x,y) = $\frac{x^3}{\sqrt{x}+1} + \log_5(5^y)$
   - f(x,y) = sinh(x) – tanh(y)
   - f(x,y) = $\log_5(\sin(x) + \cos(y))$
5. if z = $e^{x^2} + 3^y$, x = $\frac{\sin(t)}{\cos(t)}$, y = 2 $\cos^2(t)$. What is $\frac{dz}{dt}$
6. Implement code of the gradient descent on f(x) = x^2 with initial x = 0 and learning rate = 0.01