

Assignment 1(c)

Question

Find whether mixed partial derivative of second order are same or not.

$$f(x,y) = \frac{x^2 - y^2}{x^2 + y^2} \text{ at } (1,1)$$

Code

```
1  syms x y;
2  f1 = (x.^2-y.^2)/(y.^2+x.^2);
3  p = diff(f1,x);
4  q = diff(f1,y);
5  p1 = diff(f1,x,x);
6  q1 = diff(f1,y,y);
7  p2 = diff(f1,y,x);
8  q2 = diff(f1,x,y);
9  p_subs = subs(p,{x,y},{1,1});
10 q_subs = subs(q,{x,y},{1,1});
11 p1_subs = subs(p1,{x,y},{1,1});
12 q1_subs = subs(q1,{x,y},{1,1});
13 p2_subs = subs(p2,{x,y},{1,1});
14 q2_subs = subs(q2,{x,y},{1,1});
15 if(p2_subs == q2_subs)
16     disp('Mixed partial derivative are same at (1,1)');
17 else
18     disp('Mixed partial derivative are not same at (1,1)');
19 end
```

Output

```
>> Assignment_1c
Mixed partial derivative are same at (1,1)
>>
```