Date of Assignment: 06.01.2025
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Assignment 1(c)

Question

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

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

Code

```
syms x y;
f1 = (x.^2-y.^2)/(y.^2+x.^2);
p = diff(f1,x);
q = diff(f1,y);
p1 = diff(f1,x,x);
q1 = diff(f1,y,y);
p2 = diff(f1,y,x);
q2 = diff(f1,x,y);
p_subs = subs(p,{x,y},{1,1});
q_subs = subs(q,{x,y},{1,1});
p1_subs = subs(p1,{x,y},{1,1});
q1_subs = subs(q1,{x,y},{1,1});
p2_subs = subs(p2,{x,y},{1,1});
q2_subs = subs(q2,{x,y},{1,1});
if(p2_subs == q2_subs)
    disp('Mixed partial derivative are same at (1,1)');
else
    disp('Mixed partial derivative are not same at (1,1)');
end
```

Output

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