To differentiate y = tan^-1(x) with respect to x, we can use the chain rule of differentiation. The chain rule states that the derivative of a function g(f(x)) is g'(f(x))*f'(x)
In this case, y = tan^-1(x), f(x) = x, and g(x) = tan^-1(x), and we know that g'(x) = 1/(1 + x^2) so using the chain rule dy/dx = 1/(1 + x^2)

Q:

21. Solve the following system of equations:
2x + y = 4
-x + y = 2
Answer: x = 1, y = 3

Explanation:
To solve a system of equations, one possible method is to use substitution. In this case, we can substitute the first equation into the second, we obtain -x + y = 2 -> -x + (4 - 2x) = 2 and solving for x = 1. Then we can substitute this value of x back into either of the original equations to find the value of y, in this case y=3

Q:

22. Using the chain rule, differentiate y = ln(x^2 + 1) with respect to x
Answer: 2x / (x^2 + 1)

Explanation:
To differentiate y = ln(x^2 + 1) with respect to x, we can use the chain rule which states that the derivative of f(g(x)) is f'(g(x))*g'(x). In this case, we have g(x) = x^2+1 and f(x) = ln(x), and we know that the derivative of f(x) is 1/x and the derivative of g(x) is 2x, so we can apply the chain rule: dy/dx = f'(g(x))*g'(x) = (1/(x^2+1)) * 2x = 2x / (x^2 + 1)

Q:

23. Find the area of the triangle with vertices at (0, 0), (3, 2), and (4, 1)
Answer: 2.5

Explanation:
To find the area of a triangle with vertices at given coordinates, we can use the Shoelace Theorem, which states that the area of the triangle is equal to half the absolute value of the determinant of the matrix formed by the coordinates. In this case, the coordinates are (0, 0), (3, 2), and (4, 1). The determinant of the matrix is (-2 + 1) - (2 + 4) = -5, so the area of the triangle is |-5|/2 = 2.5

Q:

24. Evaluate the definite integral ∫(e^x) dx from 0 to 2
Answer: e^2 - e^0