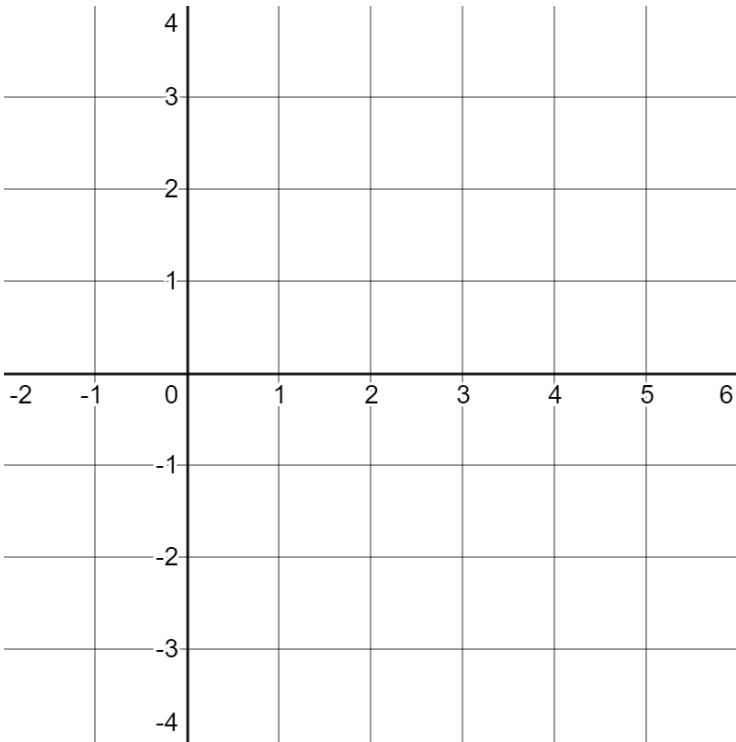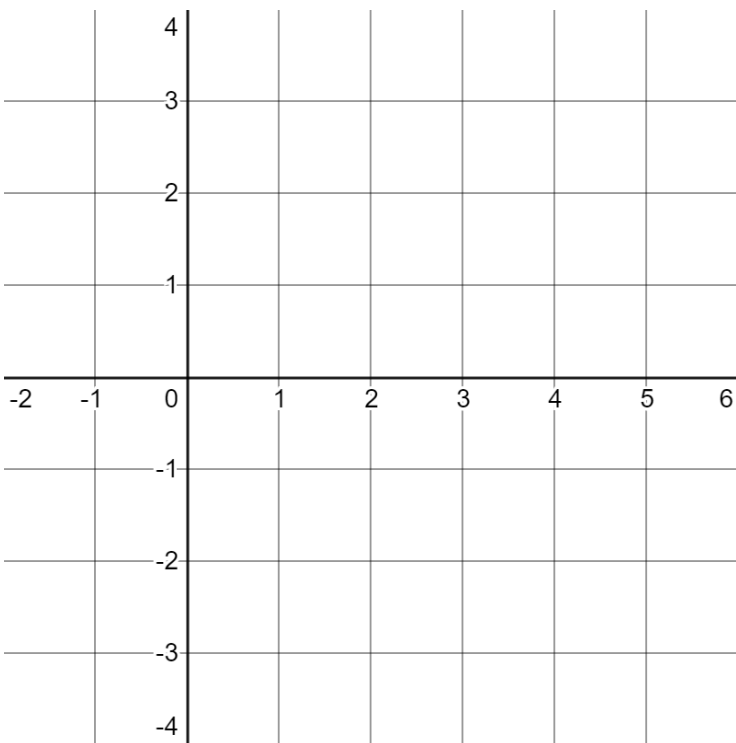# Derivative of ln and e Extra Practice and Evidence

1. Graph the following functions accurately

   a. $f(x) = 4xe^{-x}$

   b. $g(x) = x^2 \cdot \ln\frac{x}{4}$

2. Find the solutions to the following equations (all solutions are in the interval $x \in (-5, 5)$)

   a. $x + 2 = e^x$

   b. $5 - e^{\sqrt{x}} = \ln x - 2$

3. Determine the equation of all lines that are tangent to the curve $y = e^x$ and pass through the point (1,1).

4. Use log laws to find $\frac{dy}{dx}$ of the following function (next class stuff)

$$\ln y = \ln\left(\frac{(x-2)^3\sqrt{x^2+1}}{x^4+3x}\right)$$

5. Since we found $\frac{d}{dx}\ln x$ using implicit differentiation after we knew what the derivative of it's inverse was find the derivative of the inverse function f^{-1} generally.

That is, if $\frac{d}{dx}f(x) = f'(x)$ is known and $y = f(x)$, what is $\frac{d}{dx}f^{-1}(x)$?