1. (3 points) (The derivative rule for inverses) If $f$ has an interval $I$ as domain and $f'(x)$ exists and is never zero on $I$, then $f^{-1}$ is differentiable at every point in its domain (the range of $f$). The value of $(f^{-1})'$ at a point $b = f(a)$ in the domain of $f^{-1}$ is

$$(f^{-1})'(b) = \boxed{\frac{1}{f'(a)}}\text{.}$$

**Solution:** $(f^{-1})'(b) = \frac{1}{f'(a)}$

2. (3 points) (Derivative of natural logarithm)

$$\frac{d}{dx} (\ln |x|) = \boxed{\frac{1}{x}}$$

**Solution:** $\frac{d}{dx} (\ln |x|) = \frac{1}{x}$

3. (3 points) (Derivative of exponential)

$$\frac{d}{dx} (5^x) = \boxed{\ln(5)5^x}$$

**Solution:** $\frac{d}{dx} (5^x) = \ln(5)5^x$

4. (1 point) (Fall break) What did you do over Fall break?

**Solution:** Work.