Examples 5.5 – Derivatives and Antiderivatives of Exponentials and Logarithms

1. Compute each of the following derivatives. Assume y is a function of x.

   Solution: (a) $\dfrac{d}{dx}(\ln y) =$

   (b) $\dfrac{d}{dx}\left(\ln\left(x^2 + 3x - 2\right)\right) =$

   (c) $\dfrac{d}{dx}(\log_{10}(5x - 1)) =$

2. Compute each of the following derivatives. Assume y is a function of x.

   Solution: (a) $\dfrac{d}{dx}\left(e^y\right) =$

   (b) $\dfrac{d}{dx}\left(b^y\right) =$

   (c) $\dfrac{d}{dx}\left(10^{x^2}\right) =$

3. Compute each of the following antiderivatives.

   Solution: (a) $\displaystyle\int 10^x\,dx =$

   (b) $\displaystyle\int \frac{1.622}{x}\,dx =$

   (c) $\displaystyle\int \frac{3x^3 - 5x^2 + 2x - 4}{x^2}\,dx =$