

1. Let $f(x) = \ln(2x + 5) - 3$.

- A. Find the domain of
- $f(x)$
- B. Find the range of
- $f^{-1}(x)$
- . C. Find the formula for
- $f^{-1}(x)$
- .

2. Let $S(D) = 0.159 + 0.118 \log(D)$ where S is the slope of a beach and D is the average diameter (in mm) of the sand particles on the beach. If a particular beach rises 9 meters for every 100 meters inland, what size sand would you expect to find on that beach? Give an exact answer and a decimal answer.

3. Sketch a graph of each function. Include the domain.

A. $y = 7^{\log_7 x}$ B. $y = \ln e^x$

4. A. Write in terms of individual logarithms and simplify as much as possible: $\log_3 \left(\frac{\sqrt{x^2 + 9}}{81x^5} \right)$

B. Write as a single logarithm and simplify as much as possible: $-3 \ln(x) + 4(\ln(x+5) - \ln(x-5))$

5. Solve for the indicated variable. Give exact answers.

A. For x : $\frac{9^{4x}}{27} = 3^{2-5x}$

B. For t : $P_0 a^t = Q_0 e^{kt}$

C. For y : $\ln(2y-1) + \ln(y+3) = 2 \ln(3)$

D. For z : $\log_2(z^2 + 10) = 3 + \log_2(z^2 + 1)$