

SHOW ALL YOUR WORK AND BOX YOUR SOLUTIONS TO RECEIVE CREDIT.

Use the functions, $f(x) = 2x + 1$ and $g(x) = x^2 - 1$, to find the functions or values below.

1) $(f + g)(x)$

2) $\left(\frac{g}{f}\right)(1)$

3) $(f \circ g)(x)$

4) $g(f(3))$

5) Graph $f(x) = 3^{-x}$ and list the domain and range in interval notation. Be sure you label the axes and the scale.

6) The radioactive isotope of hydrogen decays according to the formula, $A = A_0 \left(\frac{19}{20}\right)^t$ where A_0 is the original amount and t is measured in years. If we have a 2-gram sample, how much should we have after 3 years. Round your answer to the nearest hundredth of a gram.

7) You plan to put \$3,500 in a certificate of deposit that pays 2.1% interest and is compounded monthly. How much money will you have at the end of 2 years?

$$A = P\left(1 + \frac{r}{k}\right)^{kt}$$

8) Graph $f(x) = \log_3 x$ and list the domain and range in interval notation. Be sure to label the axes and the scale.

9) Write the expression $\frac{1}{3} \log m + 4 \log n + 2 \log(p - 5)$ as a logarithm of a single quantity.

10) Use the change of base formula to find $\log_3 7$ to 4 decimal places.

11) Write the inverse function for $y = 5^x$.

Solve each equation. Round solutions to 4 decimal places if necessary.

12) $5^x = 3$

13) $3^{x-2} = 27$

$$14) \log_2(3x+8) = \log_2(x-2)$$

$$15) \log_2 x + \log_2(x-2) = 3$$