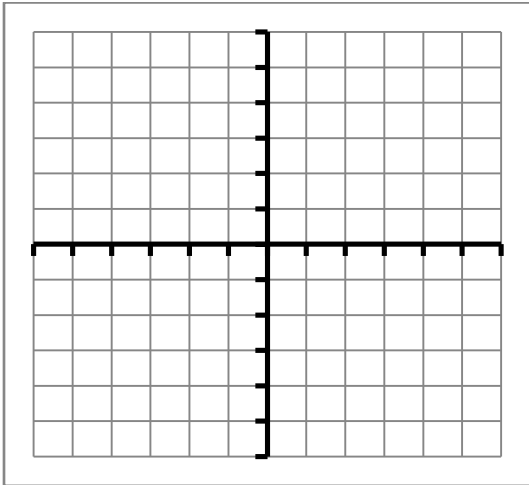
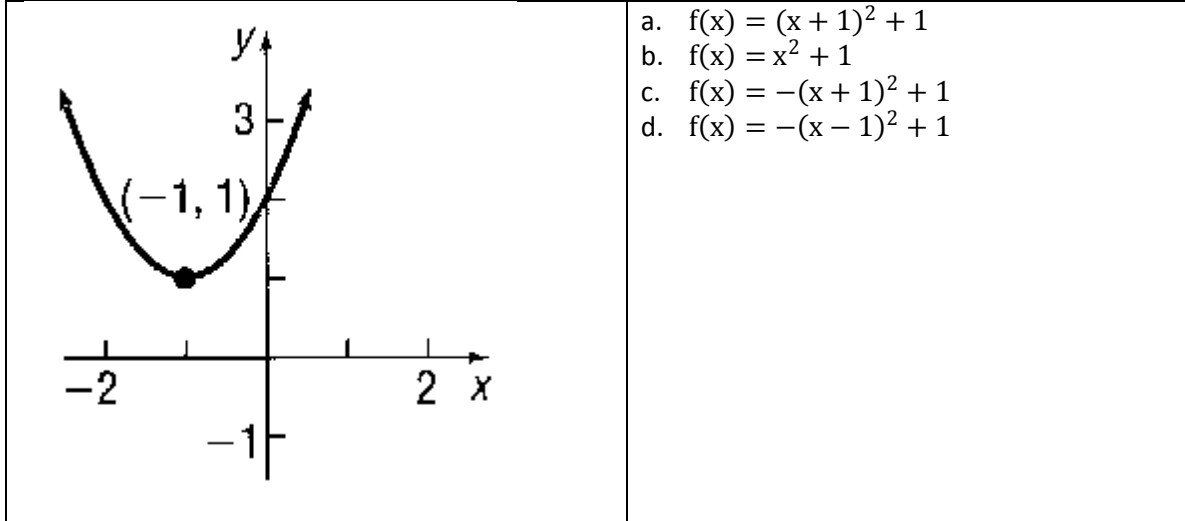


1. What is the domain of  $f(x) = \ln(2x + 1)$ ?
2. Sketch the graph of  $g(x) = 3^{-x}$ . Make a table of at least 4 values and mark the corresponding points on the graph.



3. Solve for  $x$ :
  - a.  $e^{3x} = 10$
  - b.  $\log_2(x) + \log_2(x + 2) = 3$
4. If  $\ln(2) = a$  and  $\ln(3) = b$  then answer the following in terms of  $a$  and/or  $b$ .
  - a.  $\ln(6)$
  - b.  $\ln(9)$
5. Write each of the following as single logarithm.
  - a.  $3 \log_5(u) - 4 \log_5(v)$
  - b.  $\log_3(\sqrt{x}) - \log_3(x^3)$
6. If \$500 is invested at 8% compounded quarterly, what is the value of the investment after  $2\frac{1}{2}$  years?
7. Exponential growth and decay:
  - a. The element Cesium decays according to the function  $A(t) = A(0)e^{-0.003t}$  where  $A(t)$  is the amount present after  $t$  years. If you begin with 1000 grams of Cesium, how much will be left in 10 years?
  - b. Referring to part a., when will there be exactly 100 grams of Cesium?
  - c. A colony of bacteria grows exponentially. The colony is measured and weighs 2 grams. Then 2 hours later it weighs 3 grams. Write an equation for colony's weight as a function of time.

8. Which of the given functions could have this graph? (There may be 0, 1, or more than 1 correct answer. Circle all that are correct).



9. For the quadratic function  $f(x) = x^2 - 4x$
- Put the function in standard form  $f(x) = a(x - h)^2 + k$
  - What is the vertex?
  - What is the axis of symmetry?
  - Find the x-intercepts and y-intercepts
  - Sketch the graph

