Pre-Calc Exponential and Logarithmic Functions 6.1 – 6.8 Review

1. $f(x) = \sqrt{2x-5}$ $g(x) = 3x^2 - 4$
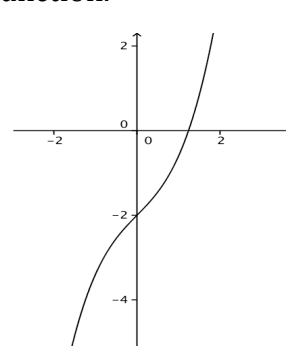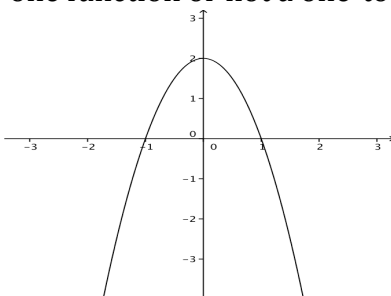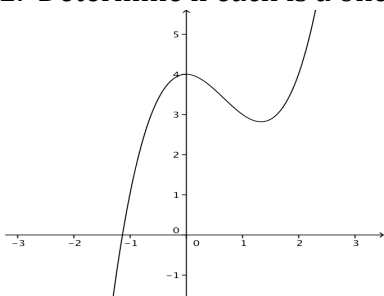
    a.) find $(f \circ g)(2)$ b.) find $(g \circ g)(-3)$

    c.) find $(g \circ f)(x)$ d.) Domain of $(g \circ f)(x)$

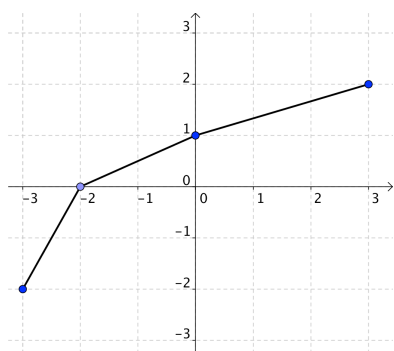2. Determine if each is a one-to-one function or not a one-to-one function.

3. Determine the domain of $f(x)$, then find its inverse. Find the domain and range of both $f(x)$ and its inverse.

    a.) $f(x) = \dfrac{x+4}{x-2}$ b.) $f(x) = \dfrac{x-3}{x+7}$

4. a.) The graph of $f(x)$ is given.

    Graph $y = x$

    and $f^{-1}(x)$.

b.) Determine the exponential equation of the graph given two points:

    (-2 , -1/8) (1 , -8)

5. Convert the logarithmic expression into an equivalent expression using an exponent.

    a.) $\log_7 4 = y$ b.) $\log_5(x+4) = 3$

6. Convert exponential expression into an equivalent expression using a logarithm.

    a.) $b^x = 5$ b.) $5^{x+4} = 8$

7. Determine the exact value

    a.) $\log_4 256$ b.) $\log_2 \dfrac{1}{8}$

8. Write the expression as a single logarithm. Express rational powers as roots.

    a.) $2\log_2 b - \dfrac{1}{2}\log_2 5 + \log_2 7$ b.) $\log_2 10 - \dfrac{1}{3}\log_2 8 - 3\log_2 v$

9. Write the expression as the sum or difference of logarithms. Express powers or roots as factors.

a.) $\ln\left(\dfrac{a^3 c^2}{d^4}\right)$

b.) $\log_4 \dfrac{\sqrt{x-2}}{x+1}$

10. Solve each equation for all real solutions. Express in exact form.

a.) $3^{-2x} = 27^{x-2}$

b.) $\log_4 x + \log_4 (x+3) = 1$

c.) $6 = 4^{4x}$

d.) $\ln(10x) = \ln(x-2) + 1$

11. Evaluate each logarithm. Round to 4 decimal places.

a.) $\log_4 12$

b.) $\log_{1.3} \sqrt{14}$

12. Solve each exponential equation. Express as exact and approximate answers rounded to 3 decimal places.

a.) $5^x = 3^{x+2}$

b.) $5^{x+2} = 7^{x-2}$

13. Find the value of $200 invested at 10% interest compounded quarterly for 8 years.

14. How long will it take for $200 to grow to $1,500 with a continuously compounded rate of 6.2%?

15. What is the initial investment required if an account grows to $3,000 at 5.3% interest compounded monthly in 10 years?

16. How long does it take for $100 to triple in value if the interest is compounded weekly at 6% APR.?

The number of bacteria on a countertop after t hours is given by the equation
   N = $950e^{0.04t}$

17. How many bacteria are present after 6 hours?

18. How long will it take for the count to be 5,000 bacteria?

There were 900 Polar Bears in the wild in 1972. In 1997, there were 2045 bears.

19. Write an equation for the number of bears t years after 1972 assuming uninhibited growth.

20. Use the equation found in question 11 to estimate the number of Polar Bears in 2015.