

# 4.1-4.3 Quiz Review

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Use the composition of functions to determine whether  $f$  and  $g$  are inverses of one another.

1.  $f(x) = 3x + 2$ ;  $g(x) = \frac{1}{3}x - \frac{2}{3}$

2.  $f(x) = 3x - 2$ ;  $g(x) = \frac{1}{3}x + 2$

Find the inverse of each function, then state the domain and range of  $f^{-1}(x)$ .

3.  $f(x) = 5x + 8$

4.  $g(x) = \sqrt{x+6}$

5.  $f(x) = \frac{x}{x+3}$

Evaluate the exponential function for the given  $x$  values.

6.  $f(x) = 2^x$       a.  $x = -5$       b.  $x = 3$       7.  $g(x) = \left(\frac{2}{3}\right)^x$       a.  $x = 2$       b.  $x = -3$

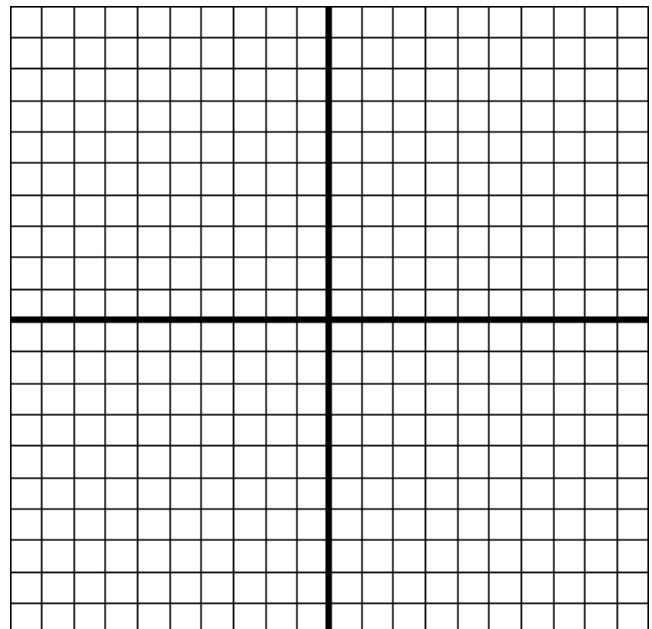
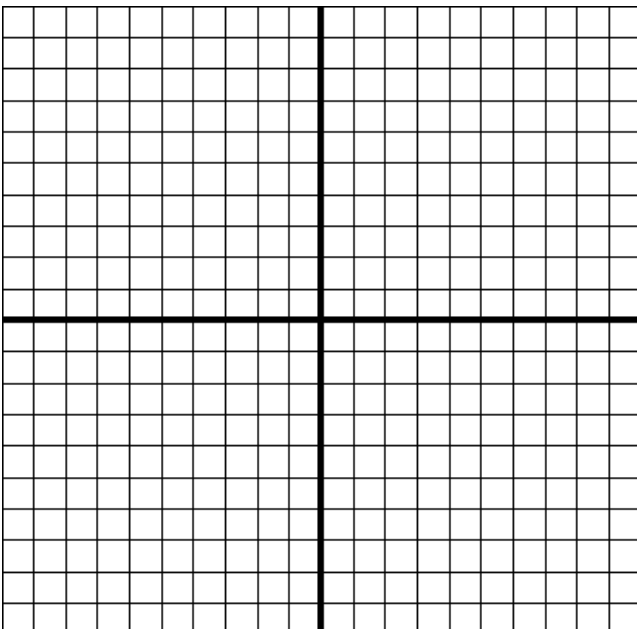
Use a calculator to evaluate the exponential function for the given  $x$  value. Round to the nearest hundredth.

8.  $f(x) = 3^x; x = 5.3$       9.  $f(x) = e^x; x = \sqrt{20}$       10.  $f(x) = \left(\frac{1}{4}\right)^x; x = -3.1$

Sketch the graph of each function.

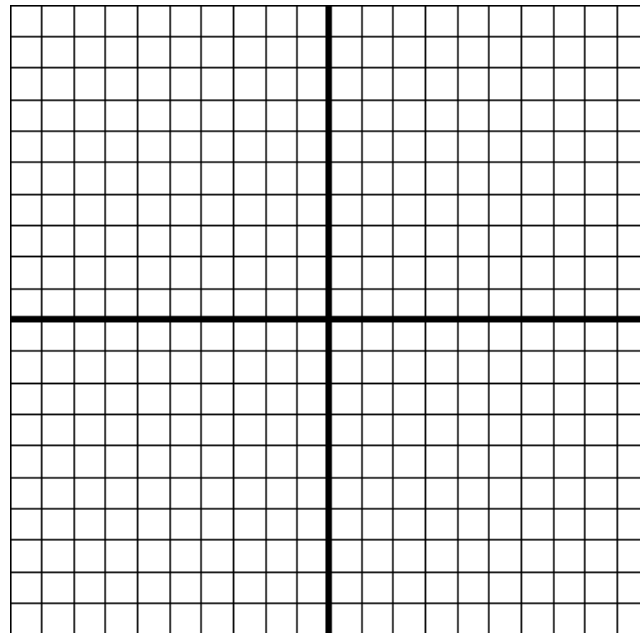
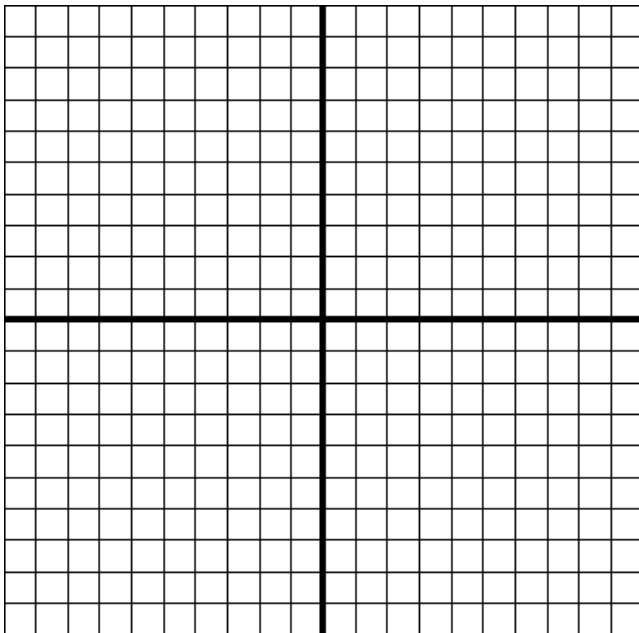
11.  $f(x) = 3^x$

12.  $f(x) = \left(\frac{1}{2}\right)^x$



13.  $f(x) = \log_{1/3} x$

14.  $f(x) = \log_4 x$



**Explain how to use the graph of the first function  $f$  to produce the graph of the second function  $F$ .**

15.  $f(x) = 2^x; F(x) = 2^{x-6}$  \_\_\_\_\_

16.  $f(x) = 4^x; F(x) = 4^{x+3} - 2$  \_\_\_\_\_

17.  $f(x) = (3)^x; F(x) = 4(3)^x$  \_\_\_\_\_

18.  $f(x) = \left(\frac{1}{3}\right)^x; F(x) = \left(\frac{1}{3}\right)^{x+2} - 3$  \_\_\_\_\_

19.  $f(x) = \log_8 x; F(x) = \log_8 x - 7$  \_\_\_\_\_

20.  $f(x) = \log_4 x; F(x) = \log_4(x+1) - 5$  \_\_\_\_\_

**Write each equation in its exponential form.**

21.  $2 = \log_4 16$

22.  $2 = \log 100$

23.  $\ln x = 8$

24.  $\log_5 125 = 3$

**Write each equation in its logarithmic form. Assume  $y > 0$  and  $b > 0$ .**

25.  $8^3 = 512$

26.  $2^5 = 32$

27.  $148.41 = e^5$

28.  $e^4 = x - 8$

**Evaluate each logarithmic expression. Do not use a calculator.**

29.  $\log_5 5$

30.  $\log_{\frac{1}{3}} 27$

31.  $2(2^{\log_2 16})$

32.  $\log_5 1$

**Find the domain of the function.**

33.  $f(x) = \log_5(x+5)$

34.  $f(x) = \log(x^2 + 6x + 5)$

35.  $f(x) = \log_3 x$

36.  $f(x) = \log\left(\frac{4}{x-4}\right)$

37. A landscaping company uses the function  $c(x) = \frac{600 + 140x}{x}$  to determine the amount, in dollars, it charges per tree to deliver and plant  $x$  palm trees.

- a. Find  $c(5)$  and explain what it represents.
- b. Find  $c^{-1}(x)$ .
- c. Use  $c^{-1}(x)$  to determine how many palm trees were delivered and planted if the cost per tree was \$160.

38. The exponential function  $A(t) = 200e^{-0.014t}$  gives the amount of medication, in milligrams, in a patient's bloodstream  $t$  minutes after the medication has been injected into the patient's bloodstream.

- a. Find the amount of medication, to the nearest milligram, in the patient's bloodstream after 45 minutes.
- b. Determine how long it will take, to the nearest minute, for the amount of medication in the patient's bloodstream to reach 50 milligrams.