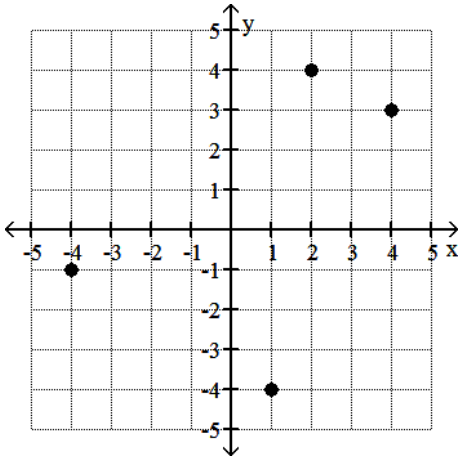
Determine if the relation defines *y* as a one-to-one function of *x*.

1) 1) _____



A) No B) Yes

A one-to-one function is given. Write an expression for the inverse function. State domain and range of $f^{-1}(x)$

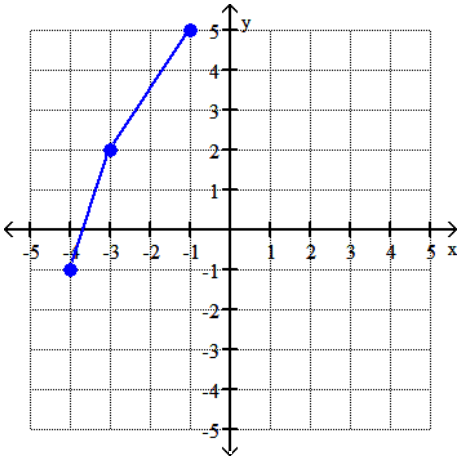
2) $f(x) = \dfrac{x + 9}{x + 5}$ 2) _____

A) $f^{-1}(x) = \dfrac{9 + 5x}{x + 1}$; Domanin & Range: $(-\infty, \infty)$

B) $f^{-1}(x) = \dfrac{9 - 5x}{x - 1}$: Domain: $(-\infty, 1) \cup (1, \infty)$; Range: $(-\infty, -5) \cup (-5, \infty)$;

The graph of a function is given. Graph the inverse function.

3)

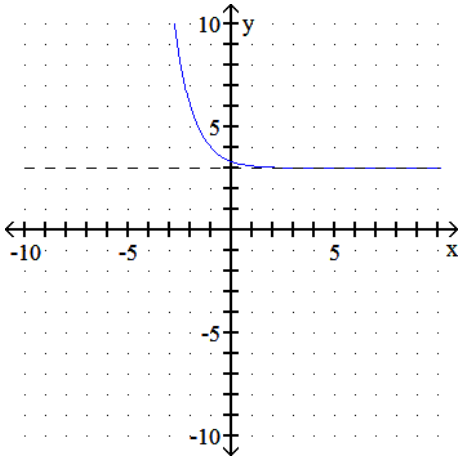


Solve the problem.

4) Use the graph of $y = \left(\frac{1}{3}\right)^x$ to graph the function. Write the domain and range in interval notation. 4) _____

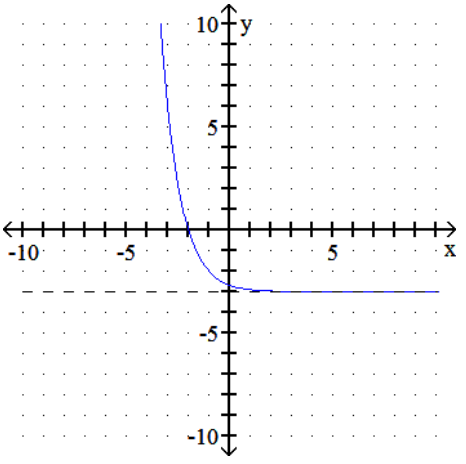
$$f(x) = \left(\frac{1}{3}\right)^{x+1} + 3$$

A)



Domain: $(-\infty, \infty)$
Range: $(3, \infty)$

B)



Domain: $(-\infty, \infty)$
Range: $(-3, \infty)$

5) After taking a certain antibiotic, the amount of amoxicillin $A(t)$, in milligrams, remaining in the patient's system t hr after taking 1,000 mg of amoxicillin is $A(t) = 1{,}000e^{-0.49t}$. How much amoxicillin is in the patient's system 3 hr after taking the medication? Round to the nearest tenth of a mg. 5) _____

A) 361.0 mg B) 229.9 mg C) 33.9 mg D) 689.8 mg

Write the equation in exponential form.

6) $\log_8 \frac{1}{512} = -3$ 6) _____

A) $\left(\frac{1}{512}\right)^{-3} = 8$

B) $8^{-3} = \frac{1}{512}$

Write the equation in logarithmic form.

7) $5^{-4} = \frac{1}{625}$ 7) _____

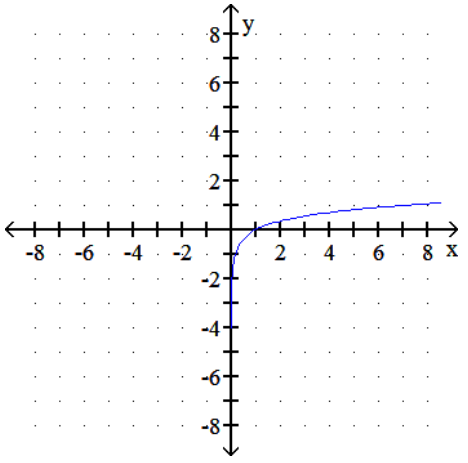
A) $\log_5 (-4) = 625$

B) $\log_5 \frac{1}{625} = -4$

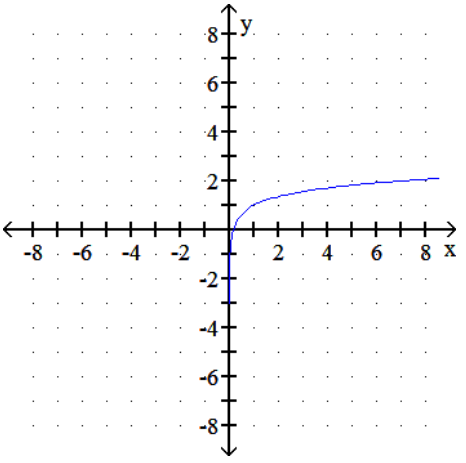
Graph the function.

8) $y = \log_7 x$ 8) _____

A)



B)



Write the logarithm as a sum or difference of logarithms. Simplify each term as much as possible.

9) $\log_6 x^4y^5$ 9) _____

A) $4\log_6 x + 5\log_6 y$

B) $\log_6 x^4 + \log_6 y^5$

10) $\log_5 \frac{a^8}{b^7 c}$ 10) _____

A) $8\log_5 a - 7\log_5 b - \log_5 c$

B) $8\log_5 a + 7\log_5 b + \log_5 c$

Write as the sum or difference of logarithms and fully simplify, if possible. Assume the variable represents a positive real number.

11) $\ln \sqrt[8]{\frac{e^7}{x^4 + y}}$ 11) _____

A) $\frac{7}{8} - \frac{1}{8}\ln(x^4 + y)$

B) $\frac{7}{8} \ln e - \frac{1}{8}\ln(x^4 + y)$

Write the logarithmic expression as a single logarithm with coefficient 1, and simplify as much as possible.

12) $\log_4 112 - \log_4 7$ 12) _____

A) $\log_4 16$ B) 2

13) $\ln p + \ln 2$ 13) _____

A) $\ln \frac{2}{p}$ B) $\ln 2p$

14) $\log_5 x - 8\log_5 y - 9\log_5 z$ 14) _____

A) $\log_5 \frac{x}{y^8 z^9}$ B) $\log_5 \frac{x}{72yz}$

Use the change-of-base and a calculator to approximate the logarithm to 4 decimal places.

15) $\log_5 17$ 15) _____

A) 0.5681 B) 0.0947 C) 1.7604 D) 0.5666

Solve the equation.

16) $32^{x+5} = 4^{3x-1}$ 16) _____

A) {3} B) {27} C) {12} D) { }

Solve the equation. Write the solution set with the exact values given in terms of natural or common logarithms. Also give approximate solutions to 4 decimal places, if necessary.

17) $3^{3x-3} = 2^{5x-4}$ 17) _____

A) $\left\{\frac{-4 \ln 2 + 3 \ln 3}{3 \ln 3 - 5 \ln 2}\right\}$; $x \approx -3.0798$ B) { }

Solve the equation. Write the solution set with the exact solutions. Also give approximate solutions to 4 decimal places if necessary.

18) $4 \log_2(9p - 95) = 8$ 18) _____

A) {11} B) { }

19) $\log_2(3x - 13) = 1 + \log_2(x - 6)$ 19) _____

A) $\left\{\frac{9}{2}\right\}$ B) $\{1\}$

Solve the logarithmic equation.

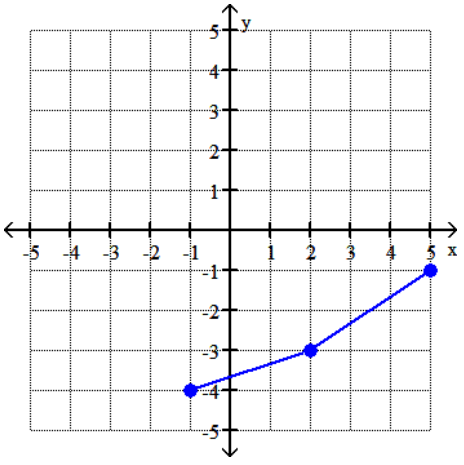
20) $13 = 11 - \log_2(12x + 4)$ 20) _____

A) $\left\{\frac{15}{48}\right\}$ B) $\left\{-\frac{15}{48}\right\}$ C) $\left\{-\frac{48}{15}\right\}$ D) { }

21) $\log x = 1 - \log(x + 3)$ 21) _____

A) $\left\{\frac{3}{2}, 5\right\}$ B) {2} C) {2, -5} D) {1, -3}

1) B
2) B
3)



4) A
5) B
6) B
7) B
8) A
9) A
10) A
11) A
12) B
13) B
14) A
15) C
16) B
17) A
18) A
19) B
20) B
21) B