SM 3H

5.5 Inverse Functions and U-substitution with Logarithms

2023-2024

SCORE: /

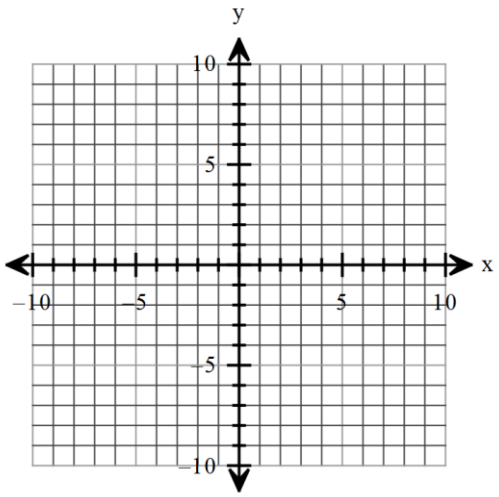
Name _____ **Date** _____ **Period** _____

Graph each function and its given inverse on the same Cartesian plane. Make a table of values for each function to get the graphs. Do not use a graphing calculator!

1. $f(x) = 3^x;\ f^{-1}(x) = \log_3 x$

x	$f(x)$

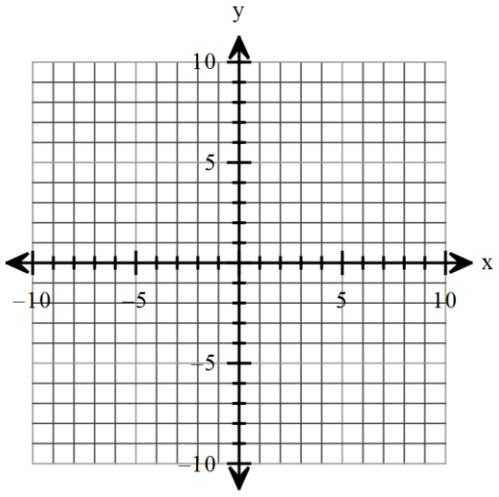
x	$f^{-1}(x)$



2. $f(x) = \left(\frac{1}{2}\right)^x;\ f^{-1}(x) = \log_{1/2} x$

x	$f(x)$

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



Find the inverse of each function. Leave all answers with positive or rational exponents if possible.

3. $f(x) = \log_5(x - 7) - 4$

4. $f(x) = \log(x) + 2$

5. $f(x) = e^x - 3$

6. $f(x) = 5^{(x-4)} + 1$

7. $f(x) = \log(2x) - 1$

8. $f(x) = \log_4(2 - x) - 3$

9. $f(x) = \frac{1}{3}e^{(2-x)} + 4$

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

11. $f(x) = -2 \cdot 3^{(1-2x)} + 5$

12. $f(x) = 5^x + 2$

Solve each equation using substitution. Show all work. Round to the nearest ten thousandths.

13. $e^{2x} - e^x - 6 = 0$

14. $e^{4x} - 3e^{2x} - 10 = 0$

15. $3^{2x} + 3^x - 20 = 0$

16. $5^{2x} + 3 \cdot 5^x - 10 = 0$

17. $6^{2x} - 6 \cdot 6^x + 9 = 0$

18. $2 \cdot 7^{2x} + 11 \cdot 7^x + 5 = 0$

Use the given function *f* to:

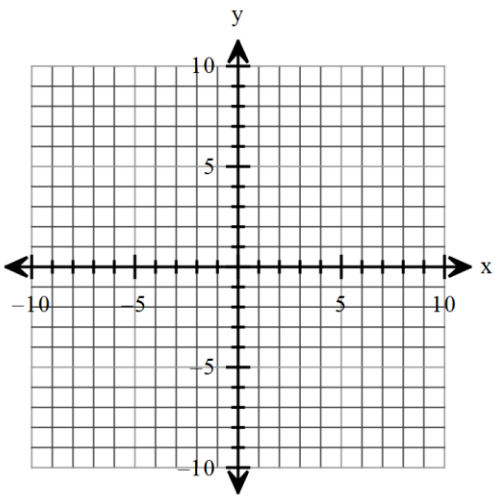
(*a*) Find the domain of *f*. (b) Find vertical or horizontal asymptote. (c) Graph *f*.

(d) From the graph determine the range and any asymptotes of *f*.

(e) Find f^{-1}, the inverse of *f*. (e) Find the domain and range of f^{-1}. (f) Graph f^{-1}

Use transformations and a table of values to get the graphs. Graph on same plane. No graphing calculators!

19. $f(x) = \ln(x+4)$



20. $f(x) = 2^{(x-4)} - 1$