Chapter 11 Test
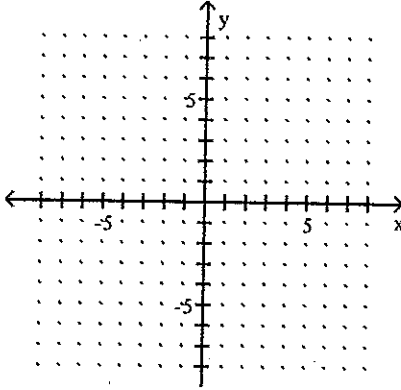
1. Sketch the graph of the given function, its inverse, and y = x on the same axis. Graph the function as a solid line and the inverse and y=x as dotted lines.   Y = 3x - 2

2. SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

2) The average number of meals per person purchased at restaurants annually for various years are listed in the table below.

Year	Average Number of Meals
1990	121.0
1992	123.5
1994	126.0
1996	132.0
1998	137.5
1999	139.0

(Source: The NPD Group, Eating Patterns in America)

Let $m = f(t)$ represent the average number of meals per person purchased at restaurants annually during the year that is t years since 1900. An equation for f is $f(t) = 2.12t - 71.01$.

i) Find an equation for f^{-1}.
ii) Find f(125). What does your result mean in terms of the situation?
iii) Find $f^{-1}(125)$. What does your result mean in terms of the situation?

Find the inverse of the given function

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

4. $f(x) = x^3 + 8$

Find the logarithm

5. $\log_3\left(\frac{1}{81}\right) =$

6. $\log_2(\log_3 81)) =$

7. Find the inverse of the function $f(x) = \log_4(x)$

Evaluate:

8. Let $f(x) = 2^x$ find $f^{-1}(4)$

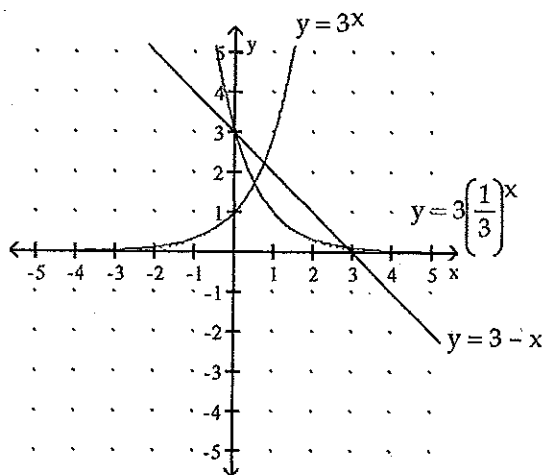9. Let $f(x) = \log_3(x)$ find $f^{-1}(2)$

Solve:

10. $3\log_5(4x + 1) = 9$

11. $\log_3(\log_2(p)) = -1$

12. $8 = 3^{7x-1}$

13. $5^x + 7 = 50 - 3(5)^x$

14. Solve using the graphs given below: $3\left(\frac{1}{3}\right)^x = 3 - x$

Write the result as a single log or ln:

15. $\log_b(7w) + 3\log_b(w)$

16. $\log_b(6x^4) - 7\log_b(x)$

17. $\quad 5\ln(p^2) + 2\ln(3p) - \ln(p^9)$

Solve:

18. $\quad 4\ln(2x) + 3\ln(x^5) = 9$

19. $\quad 2\log(2x) + 3\log(x^4) = 4$

20. $\quad 2\ln(5x) - 3 = 1$

21. Solve by using "intersect" on a graphing calculator $2e^x = 9 - 2x$
Draw the graphs here to show your answer.

22. Jeff received a gift from his father of $5000, which he invested at an annually compounded rate of 12%. Let $V = f(t)$ represent the value)in dollars) of the account after t years or any fraction thereafter. Find and equation for f. What will the value of the investment be in 14 years?

23. Revenue from board games has decayed exponentially from $11 million in 1990 to $5 million in 2007. Predict when revenue will reach $1 million.

24. A storage tank contains radium, which has a half-life of 1600 years.
   i) Let f(t) represent the percent of radium that remains in the tank at t years after the element was placed in the tank. Find an equation for f.
   ii) Predict when 20% of the radium will remain.

25. The function $900e^{-0.0099x}$ models the amount in pounds of a particular radioactive material stored in a concrete vault, where x represents the number of years since the material was put into the vault. If 900 pounds of material was placed in the vault, how much time will need to pass for only 369 pounds to remain

ANSWER SHEET   chapter 11 test

NAME _____

Show any graphs on the test form

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