Name _____ Algebra 2

Chapter 6 Practice Test

No calculator:
Simplify the expression.

1. $(8x)\,(3x)^2$

2. $\dfrac{(3x^3)^2}{6x^4}$

3. $\left[\dfrac{c^4}{b^2}\right]^3 \left[\dfrac{b^4}{c^2}\right]^2$

4. $\dfrac{m^{-6}\,p^{-3}}{m^{-1}\,p^{-7}}$

5. $\dfrac{6^3\,a^{-6}\,b^2\,c^{-4}}{2^2\,a^{-4}\,b^{-5}\,c^7}$

6. $8x^{-1/2} \cdot 2x^{2/3}$

7. $\sqrt[3]{m^{15}\,n^{18}}$

Evaluate each expression.

8. $3^2 - 2^3 =$

9. $(2 - 6)^4 =$

10. $25^{-3/2} =$

11. $36^{1/2} =$

12. $\left[\dfrac{16}{49}\right]^{3/2}$

13. $\left[\dfrac{-8}{27}\right]^{2/3}$

Solve for x.

14. $\log_{16} x = ½$

15. $\log_5 x = -2$

16. $\log_3 27 = x$

17. $\log_3 (1/9) = x$

18. $\log_7 1 = x$

19. $\log_x 16 = 4$

20. $\log_x (1/25) = ½$

21. $\log_x 8 = 3/4$

For each function: a. List the y-intercept
b. Indicate whether it is increasing or decreasing

22. $g(x) = 50(¾)^x$
23. $y = 1.2(8.09)^x$

Write an exponential function for each problem. $y = a(b)^x$

24. You invest $1500 in a mutual fund, and it earns 8% interest every year.

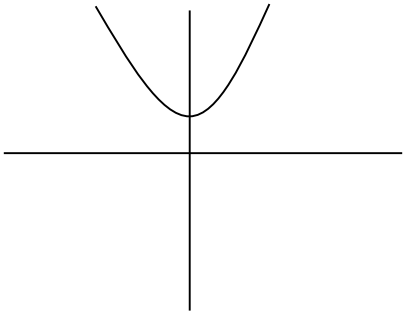
25. 180 bacteria were living on a Petri dish, and their population increased by 7% every day.

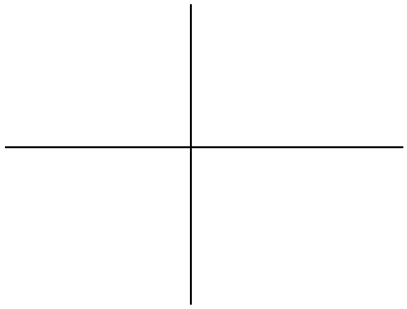
26. There were 128 ounces of ice cream in the freezer, and 1/10 of it decreased every time the freezer was opened.

Calculator section:

27. Find an equation for the inverse of $f(x) = x^3 - 8$. Is the inverse a function?

28. Draw the inverse of this function:





Solve for x.

29. $7^x = 318$

30. $2.6 \times 4^{3x} = 8.74$

31. $3.5^x - 1.6 = 0.12$

Find the value of each log.

32. $\log_4 250$

33. $\log_6 4.92$

Simplify the expression so that it has one log.

34. $\log 6 + \log 2 - \log 3$

35. $2 \log 6 - \log 4$

27. A bar of soap weighs 240 grams. After washing your hands with the soap three times, the bar weighs 208 grams. The weight of the bar decreases exponentially.
    a. Write the equation that models this situation.
    b. What is the weight of the soap after you have washed your hands 20 times?
    c. How many times do you have to use the soap to have it reach a weight of 20 grams?
28. A Petri dish has 32 bacteria on it. After 3 hours, there are 50 bacteria on the plate.
    a. Write the equation that models the growth of the bacteria.
    b. How many bacteria would you expect to have after 24 hours?
    c. At what time would you have 800 bacteria on the plate? (Round to one decimal place.)