Algebra 2
Review Ch. 7

Quiz 7.7-7.8

Test Tues. Ch. 7

whiteboards?

Example 9

Solve $3e^{5x} + 1 = 10$. Round to the nearest ten-thousandth.

$-1 \quad -1$

$$\frac{3e^{5x}}{3} = \frac{9}{3}$$

$$\ln e^{5x} = \ln 3$$

$$5x(1) = 1.0986$$

$$x = 0.2197$$

Example 10

A certain culture of bacteria will grow from 250 to 2000 bacteria in 1.5 hours. Find the constant k for the growth formula. Use $y = ae^{kt}$.

$\frac{2000}{250} = \frac{250e^{k \cdot 1.5}}{250}$

$\ln 8 = \ln e^{1.5k}$

$2.0794 = 1.5k(1)$

$1.3863 = k$

$y = 250e^{1.3863 \cdot 2}$

$1,024,034$

24. **BACTERIA** A bacteria population started with 5000 bacteria. After 8 hours there were 28,000 in the sample.

a. Write an exponential function that could be used to model the number of bacteria after x hours if the number of bacteria changes at the same rate.

b. How many bacteria can be expected in the sample after 32 hours?

7-2 Solving Exponential Equations and Inequalities

Solve each equation or inequality.

18. $16^x = \frac{1}{64}$

$4^{2x} = 4^{-3}$

$\frac{2x}{2} = \frac{-3}{2}$

19. $3^{4x} = 9^{3x+7}$

$3^{4x} = (3^2)^{3x+7}$ $\quad 6x+14$

$4x = 6x + 14$

$-6x \quad -6x$

$-2x = 14$

$x = -7$

7-3 Logarithms and Logarithmic Functions

25. Write $\log_2 \frac{1}{16} = -4$ in exponential form.

$2^{-4} = \frac{1}{16}$

26. Write $10^2 = 100$ in logarithmic form.

$\log_{10} 100 = 2$

Evaluate each expression.

27. $\log_4 256 = n$

$4^n = 256$

$4^n = 4^4$

$n = 4$

28. $\log_2 \frac{1}{8} = n$

$2^n = \frac{1}{8}$

$2^n = 2^{-3}$

$n = -3$

7-4 Solving Logarithmic Equations and Inequalities

Solve each equation or inequality.

31. $\log_4 x = \frac{3}{2}$

$4^{1.5} = x$

$x = 8$

32. $\log_2 \frac{1}{64} = x$

$2^x = \frac{1}{64}$

$2^x = 2^{-6}$

$x > 0$

33. $\log_4 x < 3$

$0 < x < 64$

$x < 4^3$

$x < 64$

35. $\log_9(3x - 1) = \log_9(4x)$

$3x - 1 = 4x$

$-3x \quad -3x$

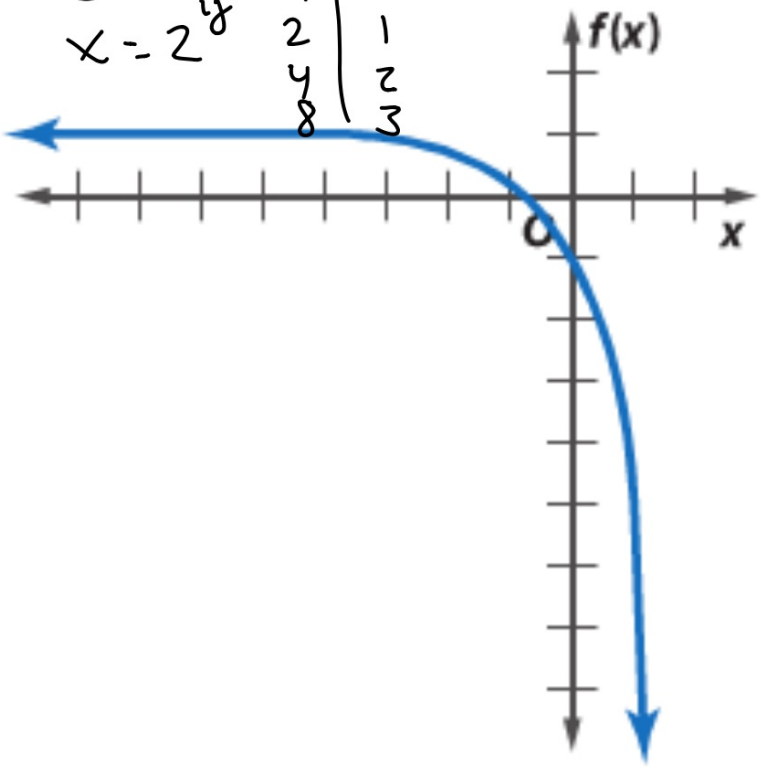
$-1 = x$

$x = NS$

$y = 2^x$

$x = 2^y$

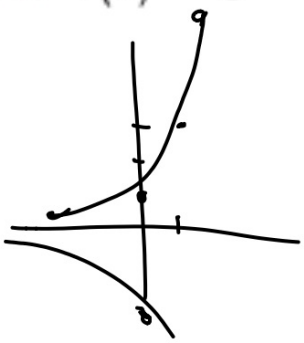
1	0
2	1
4	2
8	3



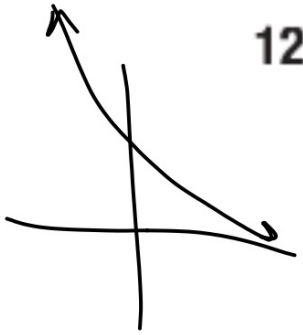
7-1 Graphing Exponential Functions

Graph each function. State the domain and range.

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



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



Example 2

Solve $4^{3x} = 32^{x-1}$ for x.

log log

$3x(\quad) = (x-1)(\quad)$

22. $9^{x-2} > \left(\frac{1}{81}\right)^{x+2}$

$(9^{-2})^{x+2}$

$9^{x-2} > 9^{-2x-4}$

$x-2 > -2x-4$

$+2x+2 \quad +2x+2$

$3x > -2$

Example 6

Use $\log_5 16 \approx 1.7227$ and $\log_5 2 \approx 0.4307$ to approximate $\log_5 32$.

$\log_5(32) = 0.4307 + 1.7227$

$(2.16) \quad = 2.1534$

$5^{(\ )} = 32$

Example 7

Solve $\log_3 3x + \log_3 4 = \log_3 36$.

Example 8

Solve $5^{3x} > 7^{x+1}$.