Algebra 2
Review Ch. 7

Quiz 7.7-7.8 Tues.
Test Wed. Ch. 7

whiteboards?

Example 9

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

$-1 \quad -1$

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

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

$5x = 1.09861$

$x = 0.21971$

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 $y = ae^{kt}$.

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

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

$$2.07944 = 1.5k$$

$$1.3863 = k$$

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?

ⓐ $28000 = 5000e^{8k}$

$y = 5000e^{0.2153 \cdot t}$

$0.2153(32)\ 5.6 = e^{8k}$

$1.72277 = 8k$

ⓑ $5000e$

$= 4,710,043$

7-2 Solving Exponential Equations and Inequalities

Solve each equation or inequality.

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

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

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

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

$3^{4x} = (3^2)^{3x+7}$

$4x = 6x + 14$

$-4x \quad -4x$

$\frac{-14}{-2} = \frac{2x}{-2}$

$x = -7$

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. $\log_4 256 = x$

$4^x = 256$

$\checkmark (0.60205) = 2.40824$

$x = 4$

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

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

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

$x = -3$

7-4 Solving Logarithmic Equations and Inequalities

Solve each equation or inequality.

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

$4^{\frac{3}{2}} = x$

$8 = x$

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

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

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

33. $\log_4(x) < 3$

$x < 4^3$

$0 < x < 64$

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

$3x - 1 = 4x$

$-3x \quad -3x$

$-1 = x$

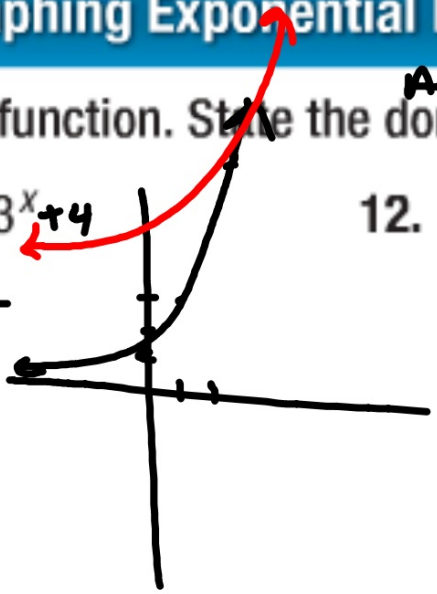
7-1 Graphing Exponential Functions

Graph each function. State the domain and range.

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

ARN

1	3
0	1
2	9



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

Example 2

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

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

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

$x-2 > -2x-4$

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

Example 6

$\log_5 5 = 1$

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

$\log_5 32 = \log_5 (16 \cdot 2)$

$= 1.7227 + 0.4307$

$= 2.1534$

2.1534

5 =

:)

Example 7

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

$12x = 36$

Example 8

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