Algebra 2
Review Ch. 7   if FFA Mon.

↓

Test: Ch. 7 Tues. 3/10 or Mon. 3/16
        (it's complicated)   ↑
        Jrs. ACT Wed. 3/11   will be here

whiteboards?

24. BACTERIA A bacteria population started with $\overset{t\,=\,0}{5000}$ 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?

$$y = 5000 \left(1.24\right)^{\cancel{32}\,32}$$

$$4{,}917{,}24\,8$$

$$y = a(b)^{t}$$

$$28{,}1\,000 = 5000\,(b)^{\frac{8}{}}$$

$$\left(5.6\right)^{\frac{1}{8}} = \left(b^{8}\right)^{\frac{1}{8}}$$

$$1.24 = b$$

Solve each equation or inequality.

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

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

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

$$\frac{2x}{2} = \frac{-3}{2} \qquad x = -1.5$$

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

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

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

$$\log_{10} 100 = 2$$

b a e

Evaluate each expression.

27. $\log_4 256 = x$

$4^x = 256$

$4^x = 4^4$

$x = 4$

28. $\log_4 \dfrac{1}{8} = x$

$(4)^x = \dfrac{1}{8}$

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

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

Solve each equation or inequality.

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

$4^{1.5} = x$

$x = 8$

32. $\log_2\!\left(\dfrac{1}{64}\right) = x$

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

$x = -6$

33. $\log_4 x < 3$

$x > 0$

$x < 4^3$

$x < 64$

$0 < x < 64$

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

$\overset{-3-1}{}$

$3x - 1 = 4x$

$-3x \qquad\quad -3x$

_____

$-1 = x$

NS

$$y = \log_2(-x+2)$$

$$y = \log_{(\ )} x$$

$$y = \log_2 x$$

x	y
1	0
2	1

$$x = 2^y$$
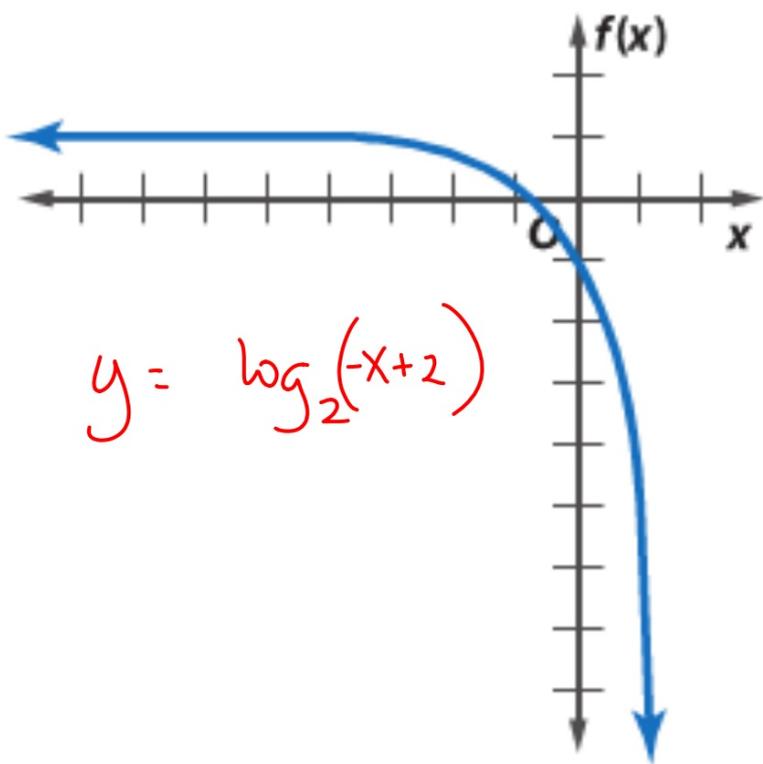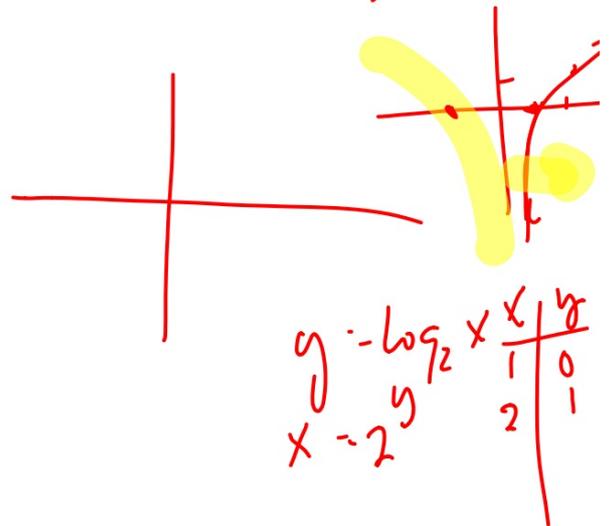
Graph each function. State the domain and range.

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

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

$y = \log_3(x-1)$

Example 2

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

$$\left(2^2\right)^{3x} = \left(2^5\right)^{x-1}$$

$$6x = 5x - 5$$

$$-5x \quad -5x$$

$$\overline{\qquad\qquad}$$

$$x = -5$$

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

$x - 2 > -2x - 4$

$\underline{+2x +2 \qquad +2x + 2}$

$3x = -2$

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

Example 6

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

Example 7

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

Example 8

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