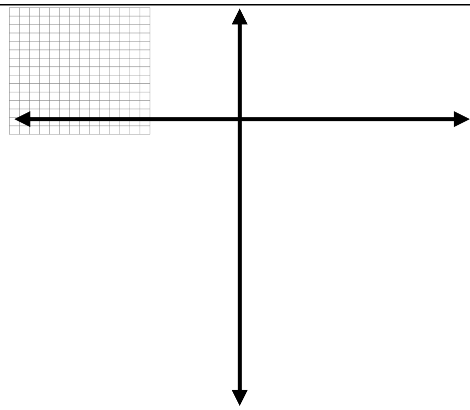
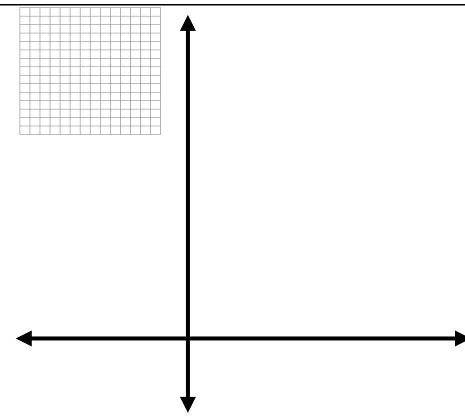
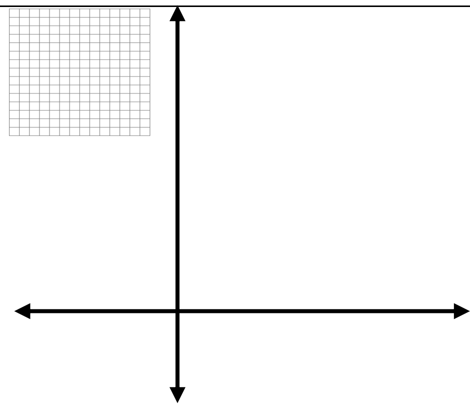
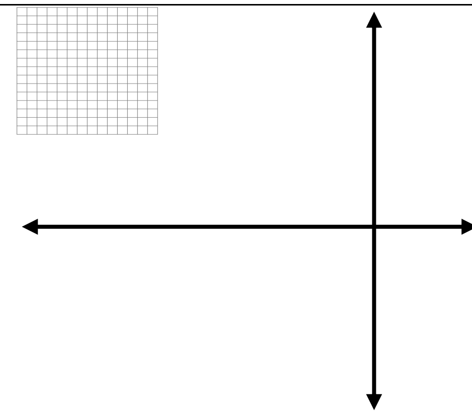
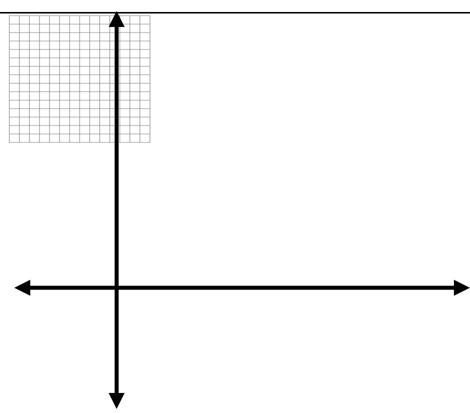
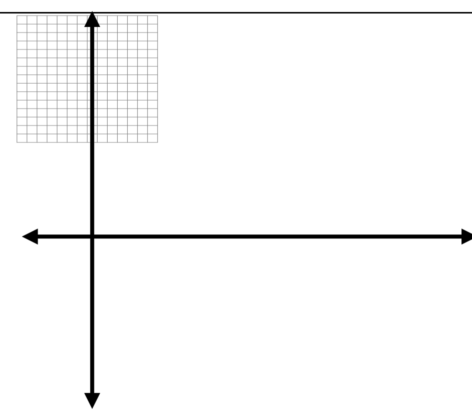
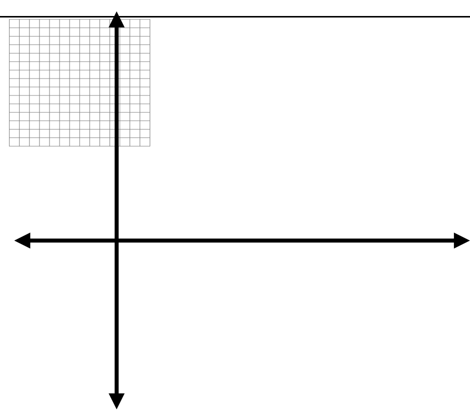
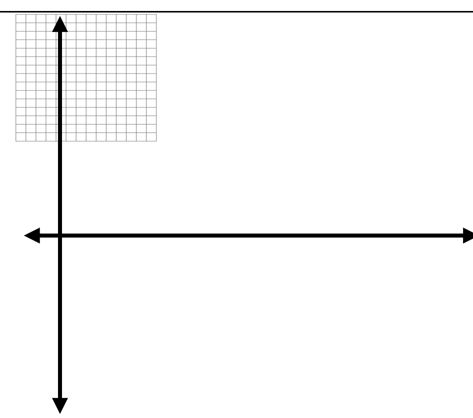
Algebra 2 T7-1 RETAKE WS Name ____________________________

Target 7-1: I can describe transformations, domain and range, and graph exponential and logarithmic functions.

1. $y = -4\left(\frac{1}{2}\right)^{x+2}$ Parent function: _______________ $a =$ meaning ____________________ $h =$ meaning ____________________ $k =$ meaning ____________________ Domain: ____________________ Range: _________________	2. $y = \frac{1}{5}(2)^{x-1}$ Parent function: _______________ $a =$ meaning ____________________ $h =$ meaning ____________________ $k =$ meaning ____________________ Domain: ____________________ Range: ______________________
3. $y = 2\left(\frac{1}{5}\right)^{x} - 1$ Parent function: _______________ $a =$ meaning ____________________ $h =$ meaning ____________________ $k =$ meaning ____________________ Domain: ____________________ Range: _________________	4. $y = \frac{1}{2}(3)^{x+4} - 5$ Parent function: _______________ $a =$ meaning ____________________ $h =$ meaning ____________________ $k =$ meaning ____________________ Domain: ____________________ Range: _________________
5. $y = 3\log_2 x + 1$ Parent function: _______________ $a =$ meaning ____________________ $h =$ meaning ____________________ $k =$ meaning ____________________ Domain: ____________________ Range: _________________	6. $y = 2\log_{\frac{1}{4}}(x-3) + 2$ Parent function: _______________ $a =$ meaning ____________________ $h =$ meaning ____________________ $k =$ meaning ____________________ Domain: ____________________ Range: _________________
7. $y = \frac{1}{2}\log_8(x+1) - 2$ Parent function: _______________ $a =$ meaning ____________________ $h =$ meaning ____________________ $k =$ meaning ____________________ Domain: ____________________ Range: _________________	8. $y = -2\log_2(x-4) + 3$ Parent function: _______________ $a =$ meaning ____________________ $h =$ meaning ____________________ $k =$ meaning ____________________ Domain: ____________________ Range: _________________

Graphs for T7-1

1. 	2. 
3. 	4. 
5. 	6. 
7. 	8. 

T7-2 RETAKE WS

Solving & Writing Exponential Equations

Solve each equation.

1. $25^{x+5} = 125^{x-3}$

2. $\left(\frac{1}{27}\right)^{\frac{1}{3}x-5} = 9^{x-3}$

3. $11^{x-4} = 121^{x+28}$

4. $\left(\frac{1}{6}\right)^{2x+2} = 216^{x-1}$

5. $\left(\frac{1}{2}\right)^{x-3} = 16^{3x+1}$

6. $3^{6x-2} = \left(\frac{1}{9}\right)^{x+1}$

Write an exponential function in the form $y = ab^x$ for the graph that passes through the given points.

7. (0, 5) and (4, 3125)

8. (0, 8) and (4, 2048)

9. $\left(0, \frac{3}{4}\right)$ and (2, 36.75)

10. (0, –0.2) and (–3, –3.125)

11. (0, 15) and $\left(2, \frac{15}{16}\right)$

12. (0, 0.7) and $\left(\frac{1}{2}, 3.5\right)$

Solve each equation.

13. $20 \cdot 400 = \left(\frac{1}{20}\right)^{7x+11}$

14. $10^{4x+8} = 1000^{x}$

15. $\left(\frac{1}{16}\right)^{3x-4} = 64^{x-1}$

16. $\left(\frac{1}{8}\right)^{x-6} = 4^{4x+5}$

17. $\left(\frac{1}{36}\right)^{x+8} = 6^{x} \cdot 216^{x-3}$

18. $128^{x+3} = \left(\frac{1}{1024}\right)^{2x}$

19. At time *t*, there are 216^{t+18} bacteria of type A and 36^{2t+8} bacteria of type B organisms in a sample. When will the number of each type of bacteria be equal?

T7-3 RETAKE WS — Side 1 – w/o properties

Solving Logarithmic Equations

Solve each equation.

1. $3x = \log_6 216$

2. $x – 4 = \log_3 243$

3. $\log_4 (4x – 20) = 5$

4. $\log_9 (3 – x) = \log_9 (5x – 15)$

5. $\log_{81} (x + 20) = \log_{81} (6x)$

6. $\log_9 (3x^2) = \log_9 (2x + 1)$

7. $\log_4 (x – 1) = \log_4 (12)$

8. $\log_7 (5 – x) = \log_7 (5)$

9. $\log_x (5x) = 2$

Solve each equation.

10. $\log_5 (–3x) = 1$

11. $\log_6 x = \log_6 (4 – x)$

12. $\log_{10} (x – 3) = 2$

13. $\log_2 (x – 5) = \log_2 (3)$

14. $\log_7 (8x + 5) = \log_7 (6x – 18)$

15. $\log_9 (3x – 3) = 1.5$

16. $\log_{10} (2x – 2) = \log_{10} (7 – x)$

17. $\log_9 (x – 1) = \log_9 (2x)$

18. $\log_{16} x \geq 0.5$

19. $\log_3 \left(\frac{x-3}{4} + 5\right) > \log_3 (x + 2)$

20. $\log_5 (3x) = \log_5 (2x – 1)$

21. $\log_3 (7 – x) = \log_3 (x + 19)$

T7-3 RETAKE WS Side 2 – w/ properties

Solving Logarithmic Equations

Solve each equation. Check your solutions.

1. $\log_7 n = \frac{2}{3}\log_7 8$

2. $\log_{10} u = \frac{3}{2}\log_{10} 4$

3. $\log_6 x + \log_6 5 = \log_6 45$

4. $\log_8 32 - \log_8 w = \log_8 4$

5. $\log_9 (3u + 14) - \log_9 5 = \log_9 2u$

6. $4\log_2 x + \log_2 5 = \log_2 405$

7. $\log_3 y = -\log_3 16 + \frac{1}{3}\log_3 64$

8. $\log_2 d = 5\log_2 2 - \log_2 8$

9. $\log_{10} (3m - 5) + \log_{10} m = \log_{10} 2$

10. $\log_{10} (b + 3) + \log_{10} b = \log_{10} 4$

11. $\log_8 (t + 10) - \log_8 (t - 1) = \log_8 12$

1**2.** $\log_3 (a + 3) + \log_3 (a + 2) = \log_3 6$

13. $\log_{10} (r + 4) - \log_{10} r = \log_{10} (r + 1)$

14. $\log_4 (x^2 - 4) - \log_4 (x + 2) = \log_4 1$

15. $\log_{10} 4 + \log_{10} w = 2$

16. $\log_8 (n - 3) + \log_8 (n + 4) = 1$

17. $3\log_5 (x^2 + 9) - 6 = 0$

18. $\log_{16} (9x + 5) - \log_{16} (x^2 - 1) = \frac{1}{2}$

19. $\log_6 (2x - 5) + 1 = \log_6 (7x + 10)$

20. $\log_2 (5y + 2) - 1 = \log_2 (1 - 2y)$

T7-4 RETAKE WORKSHEET Name______________________Per______

1. Ten grams of Carbon 14 is stored in a container. The amount C (in grams) of Carbon 14 present after t years can be modeled by $C = 10(0.99987)^t$. How much is present after 1000 years?

2. You deposit $2000 in an account that earns 5% annual interest. Write a function for each of the following frequencies. Then determine the balance after 2 years if the interest is compounded with the given frequency.

a. annually	b. quarterly	c. monthly
Function: Balance:	Function: Balance:	Function: Balance:

3. A customer purchases a television for $800 using a credit card. The interest is charged on an unpaid balance at a rate of 18% per year compounded monthly. If the customer makes no payment for one year, how much is owed at the end of the year?

4. A diamond ring was purchased twenty years ago for $500. The value of the ring increases by 8% each year. What is the value of the ring today?

5. In 1990 the tuition at a private college was $15000. During the next 9 years, tuition increased by about 7.2% each year.
   a. Write a model giving the cost C of tuition at the college t years after 1990

   b. About what year will the tuition be $20,000?

   c. If this trend continues what will the tuition be in 2010?

6. The number of newly reported cases of tuberculosis in the US in 1991 was 28,500. In 1996 it went down to 22,841. The decrease in cases models exponential decay. Write a function to model this situation where t represents the number of years since 1991.
   a. Identify the initial amount, decay factor and annual percent decrease.

   b. In what year was the number of newly reported cases in US approximately 25,000?

   c. When will the number of newly reported cases be about 16,000?

   d. Estimate the number of newly reported cases in 2005.

7. A tool & die business purchased a piece of equipment of $250,000. The value of the equipment depreciates at a rate of 12% each year.
   a. Write an exponential decay model for the value of equipment.

   b. What is the value of equipment after 5 years?

   c. Approximately when the equipment will have a value of $70,000?

8. A house was purchased for $90,000 in 1995. If the value of the home increases 5% per year, what is it worth in the year 2020?

   Function:____________________ Worth in 2020: _______________

9. You deposit $1000 in an account that earns 2.5% annual interest. Find the balance after 3 years if the interest compounds with the given frequency.

   a. **monthly**
   Function:
   Balance:

   b. **daily**
   Function:
   Balance: