Sec I – Term 3 Name_____ ID: 1

WS: T3-49 Exponential Growth and Decay Date_____ Period_____

Determine the multiplier for each growth or decay rate.

1. 5% growth
2. 12% decay
3. 30% growth
4. 98% decay
5. 1% decay
6. 300% growth
7. 0.85% growth
8. 2.5% decay
9. tripling
10. halving

State whether the formula models growth or decay. State the y-intercept and factor of change.

11. $f(x) = 3^x$:
    a =
    b =
12. $f(x) = 0.25^x$:
    a =
    b =
13. $f(x) = 1.01^x$:
    a =
    b =
14. $f(t) = 2(0.033)^t$:
    a =
    b =
15. $f(t) = 6(1.75)^t$:
    a =
    b =
16. $f(x) = 2\left(\frac{1}{2}\right)^x$:
    a =
    b =

For problems 17-20, Write the equation to model each situation. Then use the equation to answer the questions. State the **Domain** and the **Range** for each problem:

17. E. coli bacteria double in population every thirty minutes. If the initial population is 85, what's the population of bacteria after 3 hours? After one day?

18. Trevin purchases a car for $19,000. The car depreciates at a rate of 18% annually. After 6 years, Keaton offers to buy the car for $4,500. Should Trevin sell the car to Keaton? Explain.

19. The number of people who own computers has increased 23.2% annually since 1990. If 500,000 people owned a computer in 1990, predict how many people will own a computer in 2015.

20. You apply for and receive a credit card. You spend $2,000 at an interest rate of 22% per month. How much debt will you have in one month? After 2 years?

Challenge! – Write a linear equation given the following information.

$m = \frac{y_2 - y_1}{x_2 - x_1}$ $\quad$ $y - y_1 = m(x - x_1)$ $\quad$ $y = mx + b$

21. A line has a slope of 3 and passes through the point (-2, 5).

22. The lines $f(x)$ and $g(x)$ are parallel. If $f(x) = \frac{1}{2}x + 3$, what is the equation of $g(x)$ that passes through the point (4, 1).

23. The lines $f(x)$ and $h(x)$ are perpendicular. If $f(x) = \frac{1}{2}x + 3$, what is the equation of $h(x)$ that passes through the point (4, 1).

24. A line that passes through the points (0, -6) and (4, 0).

25. A line that passes through the points (-5, 9) and (6, -2)