1. Kevin has 25,000 ants in his ant farm. The ants are increased by 0.03% each year.
    a) Write an explicit equation

    b) How many ants will he have after 3 years? (Round your answer to the nearest whole number)

2. Sam has 125,000 strands of hair. His hair has started to decrease by 5% each year.
    a) Write an explicit equation

    b) How much hair will Sam have after 7 years? (Round your answer to the nearest whole number)

3. Colby invests his $20,000 into an account that earns 3.6% annually.
    a) Write an explicit equation

    b) How much money will he have after 15 years?

4. Sandra invests $2,200 into an account that earns 1.6% interest compounded quarterly.
    a) Write an explicit equation

    b) How much will be in her account after 16 years?

5. Susan bought her house in 2003 for $260,000. It's value increases by 11.3% each year.
    a) Write an explicit equation

    b) How much will it be worth in 2018? (Round your answer to the nearest hundredth)

6. Chris puts $5,000 into an account that earns 4% annually.
    a) Write an explicit equation

    b) How much money will he have after 7 years?

7. The prairie dogs population started with 13,000 in 2006. The population is decreasing by approximately by 24% each year.
   a) Write an explicit equation

   b) Approximately how many prairie dogs will there be in 2023? (Round your answer to the nearest whole number)

8. John invests $102,000 with a 0.7% interest rate compounded monthly.
   a) Write an explicit equation.

   b) How much money will he have after 13 years and 6 months?

9. Jared bought a car in 2006 for $27,000. Its value is decreased by 4.3% each year.
   a) Write an explicit equation

   b) Should he sell his car to his friend in 2014 if his friend offers him $13,000?

10. Bob has 70 sheep. His herd is increasing by 2% each year.
    a) Write an explicit equation

    b) How many sheep will there be in 10 years? (Round your answer to the nearest whole number)

11. Whitney invests her $35,000 into an account with 2.1% interest compounded quarterly.
    a) Write an explicit equation

    b) How much money will she have after 23 years?

12. A radioactive substance starts with 9,000,000 kg. It decays by 42% each year.
    a) Write an explicit equation

    b) How much of the substance will be left after 30 years? (Round your answer to the nearest hundredth)

13. Costco had 10,000 members in 1980. Each year their membership increases by 30%.
    a) Write an explicit equation

    b) How many members would they predicted to have had in 2013? (Round your answer to the nearest whole numbe

14. Jared invests $7,500 into an account that earns 3.2% interest compounded monthly.
    a) Write an explicit equation.

    b) How much will he have in his account after 24 years?

15. James invested $3,900 into an account with an interest rate of 6.5% compounded quarterly. Maria invested $3,100 into an account with an interest rate of 8.8% compounded monthly.

    a) Who has more money after 5 years?

    b) Who has more money after 10 years?

16. Given the equation, state the principal, interest rate as a percentage, and number of times compounded a year.
$$A = 420(1.03)^t$$

17. Given the equation, state the principal, interest rate as a percentage, and number of times compounded a year.
$$A = 6200\left(1 + \frac{0.018}{4}\right)^{4t}$$

18. Given the equation, state the principal, interest rate as a percentage, and number of times compounded a year.
$$A = 3400\left(1 + \frac{0.048}{12}\right)^{12t}$$

19. Given the equation, state the principal, interest rate as a percentage, and number of times compounded a year.
$$A = 12000\left(1 + \frac{0.072}{12}\right)^{12t}$$

For each problem you are given a parent function and a second equation that has been shifted vertically. Create a table for both $f(x)$ and $g(x)$ and answer the following questions. Then GRAPH. Label your axes, draw your asymptotes, and be sure to add arrows to the ends of your graphs.

20.

x	Work	$f(x) = 4^x$	$g(x) = 4^x - 5$
-2			
-1			
0			
1			
2			

20. What is the y-intercept?

$f(x)$: _____ $g(x)$: _____

21. Where is the asymptote?

$f(x)$: _____ $g(x)$: _____

22. Are these functions increasing or decreasing?
23. Are these functions above or below the asymptote?

24.

x	Work	$f(x) = \left(\dfrac{1}{3}\right)^x$	$g(x) = \left(\dfrac{1}{3}\right)^x + 2$
-2			
-1			
0			
1			
2			

25. What is the y-intercept?

$f(x)$: _____ $g(x)$: _____

26. Where is the asymptote?

$f(x)$: _____ $g(x)$: _____

27. Are these functions increasing or decreasing?
28. Are these functions above or below the asymptote?

For each problem you are given a parent function and a second equation that has been shifted vertically. Create a table for both $f(x)$ and $g(x)$ and answer the following questions. Then GRAPH. Label your axes, draw your asymptotes, and be sure to add arrows to the ends of your graphs.

$f(x) = 4(2)^x$ and $g(x) = 4(2)^x + 3$

29.

x	Work	$f(x) = 4(2)^x$	$g(x) = 4(2)^x + 3$
-2			
-1			
0			
1			
2			

30. What is the y-intercept?

$f(x)$: _____ $g(x)$: _____

31. Where is the asymptote?

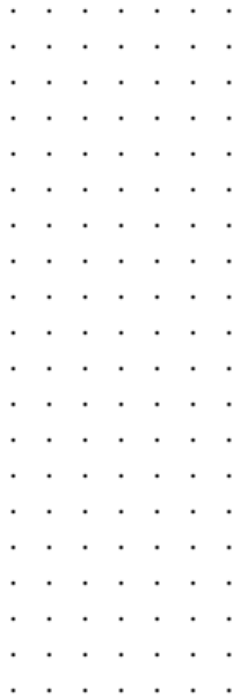$f(x)$: _____ $g(x)$: _____

32. Are these functions increasing or decreasing?
33. Are these functions above or below the asymptote?

Fill in the table for each equation. Graph each equation. Make sure to label your axes and draw your asymptote.
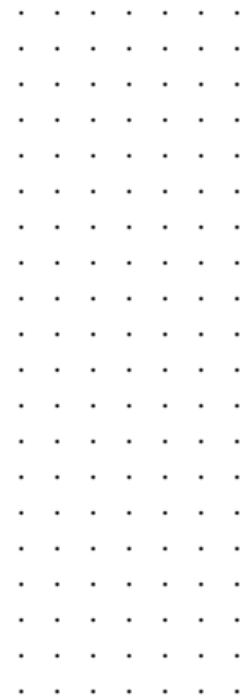
34. $f(x) = 3\left(\dfrac{1}{5}\right)^x$

x	y

35. $f(x) = 7^x$

x	y

Fill in the table for each equation. Graph each equation. Make sure to label your axes and draw your asymptote.
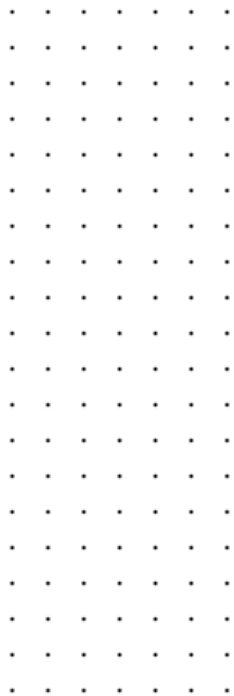
36. $f(x) = 5(2)^x$

x	y

37. $f(x) = 3^x + 5$

x	y

38. $f(x) = -4\left(\dfrac{1}{2}\right)^x - 3$

x	y

Identify the *y*-intercept and asymptote of the function, without graphing.

39. $f(x) = 9(2)^x + 4$

    y-intercept:

    asymptote:

40. $f(x) = \dfrac{1}{3}(2)^x + 5$

    y-intercept:

    asymptote:

41. $f(x) = \dfrac{1}{5}(2)^x - 7$

    y-intercept:

    asymptote:

42. $f(x) = 4\left(\dfrac{1}{2}\right)^x - 3$

    y-intercept:

    asymptote:

43. $f(x) = 7^x + 5$

    y-intercept:

    asymptote:

For the following questions,
    a) **Identify whether each equation represents a growth or decay function.**
    b) **Identify the growth/decay factor.**
    c) **Identify the percent of increase/decrease.**

44. $f(x) = 2(1.01)^x$

45. $f(x) = 10{,}000(.62)^x$

46. $f(x) = 200(2.41)^x$

47. $f(x) = 4(1.89)^x$

48. $f(x) = 100(0.085)^x$

49. $f(x) = 550(.992)^x$