Name: _____

# 5.2.D2 – EXPONENTIAL FUNCTIONS

Past due on: _____ Period: _____

Determine an exponential function of the form $y = a(r \pm 1)^t$ that satisfies the given conditions. *Refer to the 5.2 example "Writing & Solving Equations for Population Problems" in the Chapter 5 Summary.*

1. Initial value of 5, increasing at a rate of 17% per year

2. Initial value of 16, decreasing at a rate of 25% per month

3. Initial value of 5, decreasing at a rate of 0.59% per week

4. Initial population of 502,000 increasing at a rate of 1.7% per year

5. Initial height of 18 cm, growing at a rate of 5.2% per week

6. Initial mass of 15 grams, decreasing at a rate of 4.6% per day

7. Mina bought a new car for $22,000. Each year the car's value decreases by 11%. Write an exponential function that models the value of the car, *V*, after *t* years.

8. The enrollment at a school is currently 550 students and is projected to grow at a rate of 8% each year. Write an exponential function that models the enrollment, *E*, after *t* years.

Write a function that represents the balance in the account as a function of time, *t*, **and** determine the account balance after 10 years. *Refer to the 5.1 examples "Writing & Solving Simple Interest & Compound Interest Equations" in the Chapter 5 Summary.*

9. Serena deposits $2700 into a compound interest account. The interest rate for the account is 4.25%.

10. Julian deposits $5000 into a simple interest account. The interest rate for the account is 2.75%.

Simplify the product using the product rule. *Refer to the Properties of Exponents on your Chapter 5 Summary Sheet.*

11) $-9x^2 \cdot 8x^3$

12) $5p \cdot 10p^2$

13) $(-2d^2)(-13d)$

Simplify the quotient using the quotient rule. Your answer cannot contain any negative exponents. *Refer to the Properties of Exponents on your Chapter 5 Summary Sheet.*

14) $\dfrac{a^{15}}{a^{11}}$

15) $\dfrac{2x^{10}}{4x^3}$

16) $\dfrac{10m^8}{5m^5}$

Define variables and write a system of equations to represent each situation. Solve each system of equations using the appropriate method. Write your solution as an ordered pair $(x, y)$. *Refer to the 6.3 example "Writing a Linear System of Equations to Represent a Problem Context" in the Chapter 6 Summary.*

17. Mika is buying party favors. She buys a certain number of bracelets and plastic rings. Each plastic ring costs $0.75 and each bracelet costs $1.25. She bought a total of 20 items and spent $17.50. How many of each type of item did Mika buy?

*Let x = the number of bracelets & y = the number of plastic rings.*

*Equation 1:* _____ *& Equation 2:* _____

Solve the system of equations.

Interpret the solution of the linear system in terms of the problem situation.

18. Which of the following points is a solution to the linear inequality $4x - 3y \geq 9$? *Circle ALL that apply.*

$(-2, -6)$      $(-3, -4)$      $(0, 0)$      $(0, 3)$      $(1, -2)$      $(5, 3)$

19. Which of the following points is a solution to the system of linear inequalities given below? *Circle ALL that apply.*

$$4x - 5y \leq 20$$
$$y > 2x - 6$$

$(-2, 4)$      $(-1, -5)$      $(0, 0)$

$(1, -3)$      $(4, 0)$      $(5, 4)$

Use the given information to write the explicit formula of the arithmetic sequence. The use the explicit formula to find the specified term. *Refer to the 4.3 example "Writing Explicit Formulas for Arithmetic & Geometric Sequences" in the Chapter 4 Summary.*

20. $a_1 = 14, d = 6$
Find: $a_{15}$

21. $a_1 = 52, d = -5$
Find: $a_{12}$

22. $a_1 = 10, d = -4.5$
Find: $a_8$

Use the given information to write the explicit formula of the geometric sequence. The use the explicit formula to find the specified term. *Refer to the 4.3 example "Writing Explicit Formulas for Arithmetic & Geometric Sequences" in the Chapter 4 Summary.*

23. $a_1 = 3, r = 20$
Find: $a_5$

24. $a_1 = 5000, r = 0.2$
Find: $a_9$

25. $a_1 = 2, r = -4$
Find: $a_6$

*Chapter 5: Exponential Functions*