8A Arithmetic Sequences

Name: _____Per: _____

SHOW YOUR WORK. WORK IN PENCIL

Due Date: January 24th / January 25th

1. Find each value for the following. Do not use decimals.

   a. $3^3 =$ b. $3^2 =$ c. $3^1 =$ d. $3^0 =$ e. $3^{-1} =$ f. $3^{-2} =$

2. Find the value of the function given. Use **function notation** to give your answers.

   Example:
   $f(x) = 2x$; $find\ f(1), f(2), f(3)$
   $f(1) = 2, f(2) = 4,$ and $f(3) = 6$

   b. $f(x) = x^2 - 25$; $find\ f(1), f(2),$ and $find\ x\ when\ f(x) = \pm 5$

   a. $f(x) = 2^x$; $find\ f(1), f(2), f(3)$

   c. $f(x) = 2(x - 1) + 3$; $find\ f(1), f(2), f(3)$

3. Complete each table. **State the "d"** (<u>common difference</u>) that shows how to find the next term. Write the **Recursive Equation** (to find the next term) and **Explicit Equation** (to find any term). Find the 100th term.

a.

Term x	1st	2nd	3rd	4th	5th	6th	7th	8th
Value $f(x)$	2	4	6	8	10			

Com d _____ Recursive Eq: _____ Explicit Eq: _____ 100th term: _____

b.

Term x	0	1st	2nd	3rd	4th	5th	6th	7th
Value $f(x)$	52	49	46	43	40			

Com d _____ Recursive Eq: _____ Explicit Eq: _____ 100th term: _____

c.

Term x	1st	2nd	3rd	4th	5th	6th	7th	8th
Value $f(x)$	-1	-6	-11	-16				

Com d _____ Recursive Eq: _____ Explicit Eq: _____ 100th term: _____

Given a term from an **arithmetic sequence** and **common difference**, write the **explicit & recursive** equations.

4. $f(1) = 28$, Common Difference $= 10$

   a. Recursive Equation: _____

   b. Explicit Equation: _____

5. $f(2) = 35, d = 4$

   a. Recursive Equation: _____

   b. Explicit Equation: _____

6. $f(1) = 39, d = -5$

   a. Recursive Equation: _____

   b. Explicit Equation: _____

7. $f(0) = -26, d = 200$

   a. Recursive Equation: _____

   b. Explicit Equation: _____

Given the following, make a table (at least **4 values**) OR graph the situation with **<u>simple</u>** interest.

8. Luke has $200 to put in the bank at a **15% simple annual** interest rate.

   a. How much money will he make in interest EACH year? _____

   b. What is the rate of change? _____   c.   Write the recursive equation: _____

   d. What is the y-intercept? _____

   e. Complete the table

   f. How much **total money** will he have

      in 1 year? _____

   g. Write an equation to determine the

      amount of money in the bank at any time. _____

n	Pattern	F(n)	Shorthand

9. Carl put $250 in the bank at a 10% simple annual interest rate.

   a. How much money will he make in just interest EACH year? _____

   b. Write the recursive equation _____

   c. What is the y-intercept? _____

   d. How much **total money** will he have in 1 year? _____

   e. How much in just **interest** will he make in year 2? _____

   f. How much **total money** will he have at the end of year 2? _____

   g. Graph the amount of money in the bank. Make sure you label the scale the axes.

   h. Write the explicit equation to determine the total amount of money in the bank at any time._____
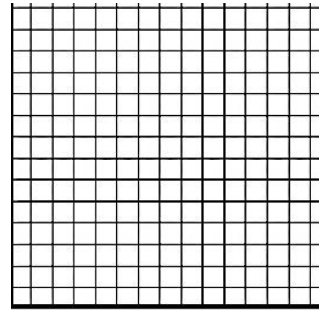
10. Jessica has $500 to put in the bank at an 8% annual SIMPLE interest rate.

   a. Complete the table.

   b. How much will she earn in **interest** in

      year 1? _____

   c. How much **total money** will she have

      after 1 year? _____

n	Pattern	F(n)	Shorthand

   d. How much **interest** will she earn in year 4? _____

   e. Write TWO equations. Explicit: _____Recursive:_____

   f. Find $f(10)$. _____ Does that it mean? _____

11. Katrina takes out a $300 loan at a 20% annual **SIMPLE interest** rate. She agrees to not make ANY

   payments, but will pay off the loan in five years.

   a. How much will she owe in **just interest** after 1 year? _____ What is the slope? _____

   b. Write a recursive equation. _____ Write an explicit equation. _____

   c. If she never makes a payment, how much money will she owe after five years? _____