Name _____

HW30: 10E Worksheet (Sequences as Functions w/Modeling)

Solve. You must use an arithmetic or geometric function to solve.

1) Dad has a Babe Ruth baseball card that increases $28 dollars more each year. It is currently (2013) worth $1580. How much will it be worth in 2032?

2) If Chelsey takes a nap for 2 hours Monday, 5 hours Tuesday, and 8 hours Wednesday, how many hours did she sleep for the week?

3) Amy eats 3 cookies the first day of the week, 6 cookies the seconds day and 12 cookies the third day. How many cookies did she eat in the entire week?

4) I have 512 cupcakes in my bakery at the beginning of the week. The next day I have 256 cupcakes and the third day I have 128. If I continue sell them at the equivalent rate, how many cookies are left in day 10?

5) Babe's average homerun total starts at 24 in year one and increases by 25% per year. How many total homeruns has he hit in his career after 8 years? Round to the nearest homerun.

6) Debby is going holiday shopping. On her first shopping day, mom spent $900, $850 on the second day, and $800 on the third day. If mom continues to spend less, how much will she have spent, in total, after the twelfth day?

7) Bam goes to swim practice every day, constantly increasing the distance he swims, starting at 1 meter. If he continues to triple his distance, how far has he swam, total, after 10 days?

8) You make $2.00 your first hour of work, $4.00 your second hour, and $6.00 your third hour. How much money will you make in the 12^{th} hour?

9) A person moves to the United States with $500,000 inheritance and starts to lose 20% to taxes each year. How much of the $500,000 do they have, after taxes, in year nine if they spend none of the original amount?

10) At practice a gymnast practices her first tumbling pass from her routine. The first flip she does she flips 6 feet off the ground and each flip afterwards only goes 90% as high as the previous. How high will her last flip be if she does 8 total flips? Round to the nearest tenth of a foot.

11) Billy and his friends make soda. After the first day they made 3 liters of soda. On day 2, they made 5 liters of soda, and on day 3 they made 7 liters of soda. If they started on the first day of February, how much soda did they make on the last day of the month considering it's a leap year?

12) You want to start getting back into shape by jogging. You start by jogging a total of 5 miles for the first week. Each week your weekly distance increases by 20%. How many calories will you have burned at the end of 8 weeks if 1 mile burns 400 calories? Round to the nearest calorie.

State whether the following formulas are recursive or explicit. Write the first five terms for each sequence.

13) $f(n) = -3x^2 - 1$

14) $f(1) = 3$ and $f(n) = -f(n-1) + 7$

Write a general term function for each sequence.

15) $-1, -5, -9, -13, \ldots\ldots$

16) $\frac{3}{8}, -\frac{1}{8}, \frac{1}{24}, -\frac{1}{72}, \ldots\ldots$

Write the general term arithmetic function.

17) $f(6) = 14$ and $f(10) = 38$

18) $f(7) = -15$ and $f(16) = -33$

Write the general term geometric function.

19) $f(6) = 25$ and $f(9) = \frac{1}{5}$

20) $f(5) = -5$ and $f(9) = -80$

Answers

1. $2084
2. 77 hours
3. 381 cookies
4. 1 cupcake
5. 476 homeruns
6. $5750
7. 29,524 meters
8. $24
9. $83,886.08
10. 2.9 feet
11. 59 liters of soda
12. 32,998 calories
13. explicit, -4, -13, -28, -49, -76
14. recursive, 3, 4, 3, 4, 3
15. $f(n) = -4n + 3$
16. $f(n) = \frac{3}{8}\left(-\frac{1}{3}\right)^{n-1}$
17. $f(n) = 6n - 22$
18. $f(n) = -2n - 1$
19. $f(n) = 390{,}625\left(\frac{1}{5}\right)^{n-1}$
20. $f(n) = -\frac{5}{16}(2)^{n-1}$