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SHOW YOUR WORK FOR FULL CREDIT. NO WORK, NO CREDIT. NO WORK IN PEN.

1. Natalie bought a $\$ 1000$ computer with a financing option. She doesn't have to make any payments for 5 years, but each year, she has to pay $\mathbf{1 5 \%}$ interest on the original loan amount of $\$ 1000$.
a. How much interest will she have to pay for the first year on her loan? $\qquad$
b. How much more money will she have to pay in interest the second year? $\qquad$
c. To the right, make a table to show how much money she will have to pay including interest and the original amount each year.
d. Write an equation to calculate the amount due with interest for any year
e. How much will she have to pay total for the full 5 years? $\qquad$
f. Explain how you figured your answer for part e.

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2. The loan described in \#1 is called "Simple Interest".
a. Write an equation that would calculate any amount of simple interest on any size loan.
b. Write an equation that would calculate the total amount of money due for any size on any year of a simple loan.
c. Explain each of the variables you used in your equation in part b: $\qquad$
3. Natalie's loan could be written as what kind of sequence? $\qquad$
4. Miranda recognizes that Natalie will pay a lot in interest. She mentioned that she bought a computer at the same price and will pay it off in the same 5 years, but her interest rate is only $\mathbf{1 2 . 5 \%}$. The difference is that her interest is compounded annually. (She will pay interest on the initial amount as well as the past interest.). Make a table to show how much she pays on her loan each year for 5 years.

a. How much interest will she have to pay for the first year on her loan?
b. How much interest will she have to pay in the second year? $\qquad$
c. How much will Miranda pay total over the 5 years? $\qquad$
d. What equation shows Miranda's debt over the 5 years: $\qquad$
e. Explain the different elements of the equation you used: $\qquad$
5. Graph and label both equations that you wrote for Miranda and Natalie.
6. Whose payment plan is better? $\qquad$ How do you know? $\qquad$
$\qquad$
7. Nadia received $\$ 200$ for her 10th birthday. She put it in a bank with a $7.5 \%$ interest compounded yearly. Assuming she doesn't deposit or withdrawn from it,

a. Write a recursive equation. $\qquad$
b. Write an explicit equation to describe the amount of money in the bank. $\qquad$
c. How much money will she have in the bank by her 21st birthday? $\qquad$
d. How much money will she have in the bank on her $50^{\text {th }}$ birthday? $\qquad$
8. Peter earned $\mathbf{\$ 1 5 0 0}$ and deposited the money that earned $\mathbf{5 \%}$ interest yearly.

## If the growth is arithmetic,

a. Write a recursive equation that describes the amount of money in the bank. $\qquad$
b. Write an explicit equation that describes the amount of money in the bank. $\qquad$
c. How much money would Peter have in 5 years? $\qquad$
If the growth is geometric,
d. Write a recursive equation that describes the amount of money in the bank.
e. Write an explicit equation that describes the amount of money in the bank. $\qquad$
f. How much money would Peter have in 5 years? $\qquad$
g. Write the equation if his initial deposit was only $\$ 1000$ ? $\qquad$
h. How much money would he have in 5 years if his initial deposit was only $\$ 1000$ ? $\qquad$
i. Write the explicit equation if he put $\$ 1500$ in an account that paid $5.25 \%$ yearly? $\qquad$
j. How much money would he have in 5 years with this higher interest rate? $\qquad$
k. At this rate, when will Peter have $\$ 20,000$ in his account? $\qquad$

1. Find $f(20)$. $\qquad$ What does that mean? $\qquad$
2. Using the points $(\mathbf{2}, 5)$ and $(\mathbf{3}, \mathbf{2 0})$.
a. Complete the table for the

ARITHMETIC sequence.

| X | 2 | 3 | 4 | 5 |
| :---: | :---: | :---: | :---: | :---: |
| Y | 5 | 20 |  |  |

b. Write a recursive equation for the sequence. $\qquad$
c. Write an explicit equation for the Sequence. $\qquad$
d. Find $f(10)$ $\qquad$
e. Complete the table for the

GEOMETRIC sequence.

| X | 2 | 3 | 4 | 5 |
| :---: | :---: | :---: | :---: | :---: |
| Y | 5 | 20 |  |  |

f. Write a recursive equation for the sequence. $\qquad$
g. Write an explicit equation for the Sequence.
h. Find $f(10)$ $\qquad$
10. McKenna buys a new car for $\$ 20,000$. The depreciation (loss in value) of the car is $18 \%$ each year.
a. Make a table to show the worth of the car each year for 5 years.
b. Write the explicit equation to show the value of the car at $t$ years?
c. Write a recursive equation.
d. How much will her car be worth after 10 years.
e. How long will it take McKenna's car to be worth under $\$ 500$ ?
f. How long before McKenna's car is worth nothing? Explain $\qquad$

11. If $f(x)=3(0.85)^{x}$
a. Make a table.
b. Increasing or decreasing?
d. Common Ratio (Multiplier)
e. Find $f(5)=$
c. Find the Initial amount or $f(0)$
12. If $g(x)=3(1.15)^{x}$
a. Make a table.
b. Increasing or decreasing?
$\qquad$
c. Find the Initial amount or $g(0)$
d. Common Ratio (Multiplier)

e. Find $g(5)=$ $\qquad$

