GGG Investigations 1-3 Test (Algebra 8 2007)

Directions: Show all thinking! Use only pencil and remember to complete the heading at the top wtih your first, last name and period. Do your best! I know you will do well.

1) Janelle deposits $2,000 in the bank. The bank will pay 5% interest per year, compounded annually. This means that Janelle's money will grow by 5% each year.

   a. Make a table showing Janelle's balance at the end of each year for 4 years.

YEAR	0	1	2	3	4
BALANCE ($)	2000	2100	2205	2315.25	2431.01

   b. Write an equation for calculating the balance, b, at the end of any year t.

   $$b = 2000(1.05)^t$$

   c. Approximately how many years will it take for the original deposit to double in value? Explain your reasoning.

   After 15 years the original deposit will double.

   Reasoning?
   a) I counted how many times I had to multiply 2000 by 1.05 to get 4000

   b) I used my calculator to find what exponent I had to raise 1.05 to to get it to equal 2.

   d. Suppose the interest rate is 10%. Approximately how many years will it take for the original deposit to double in value? How does this interest rate compare with an interest rate of 5%?

   After 8 years the original deposit will double.

   This interest rate is twice the original interest rate and it takes about half the time for the original amount to double.

2) The tables below represent three savings plans.

- Cela receives $20 for her birthday on January 1, puts it in her drawer, and adds $4 to it every month.

- Beginning in January, Larry hides $20 under his mattress every month.

- Noah deposits $20 in a savings account at the beginning of January and makes no more deposits. The bank adds interest to his account at a rate of 1.2% per month.

Plan 1	
Month (m)	Amount (A)
0 Jan	$20
1 Feb	$40
2 Mar	$60
3 April	$80

Plan 2	
Month (m)	Amount (A)
0 Jan	$20
1 Feb	$20.24
2 Mar	$20.48
3 April	$20.73

Plan 3	
Month (m)	Amount (A)
0 Jan	$20
1 Feb	$24
2 Mar	$28
3 April	$32

$y = 20x + 20$ $y = 20(1.012)^x$ $y = 4x + 20$

a. Whose plan is plan 1?

Plan 1 is Larry's Plan.

b. How long does it take for the original amount of money to double in plan 1?

It takes 1 month for the original amount to double.

c. Write an equation to model the growth in plan 1.

$y = 20x + 20$

d. Whose plan is plan 2?

Plan 2 is Noah's plan.

e. How long does it take for the original amount of money to double in plan 2?

It will take about 60 months for the original amount to double.

f. Write an equation to model the growth in plan 2.

$y = 20(1.012)^x$

g. Whose plan is plan 3?

Plan 3 is Cela's Plan.

h. How long does it take for the original amount of money to double in plan 3?

It will take 5 months for the original amount to double.

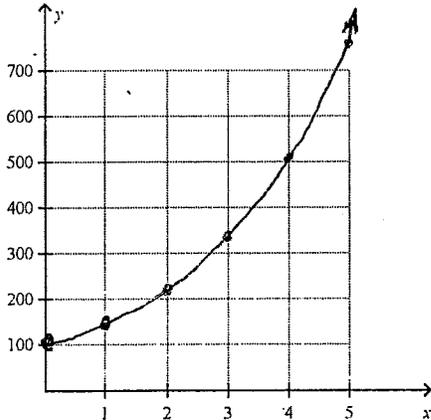**i.** Write an equation to model the growth in plan 3.

$y = 4x + 20$

3) Tribetts are fuzzy insects that reproduce at the rate of 50% every day. Suppose you begin with 100 tribetts.

    a. Make a table showing the growth in the number of tribetts for the first 5 days, round to the nearest Tribett.

Day	0	1	2	3	4	5
Tribetts	100	150	225	338	506	759

    b. Make a graph for this relationship.

    c. On what day will there first be 5,000 tribetts?

There will first be 5000 tribetts on the 10th day.

$$T = 100(1.5)^{10}$$
$$= 5767$$

    d. Write an equation for the relationship between days d and numbers of tribetts T.

$$T = 100(1.5)^d$$

4) The table below shows an exponential pattern.

X	**0**	**1**	**2**	**3**	**4**	**5**
Y	**1**	**1.2**	**1.44**	**1.728**	2.0736	2.48832

×1.2   ×1.2   ×1.2   ×1.2   ×1.2

a. Continue the table by giving the values for the next column.

b. Write an equation that represents the pattern in the table.

$$y = (1.2)^x$$

c. What is the growth factor? Growth rate? Explain how you determined these.

Growth factor = 1.2   I determined this by "dividing up" the table. To create the table I multiply if y-value by 1.2 to get the next y-value.

Growth Rate = 20%   GF = 1 + Growth Rate
$$1.2 = 1 + GR$$
$$\underline{-1 \quad -1}$$ → .2 represents 20%
$$.2 = GR$$

5) Write the numbers in scientific notation.

a.) 235,600 =

$$2.35 \times 10^5$$

b.) 968,456,030 =

$$9.6845603 \times 10^8$$

Write the numbers in standard form.

a.) 3.45×10^7 =

34,500,000

b.) 7.02×10^{11} =

702,000,000,000

6) Change the growth factor to a rate or the growth rate to a growth factor.

growth rate	growth factor
25%	1.25
4%	1.04
8%	1.08
200%	3