Reading Questions 9.2 (33 points) Name___________________________

After reading Section 9.2 completely, answer the questions below. Due Date: _____________________

Bring this completed sheet with you to class on the due date to be handed in at the very beginning of the period.

1. In the first example of Section **9.2**, you found that in year $t = 0$ (corresponding to today), you deposit **$1000** in an account which is compounded annually at 5%. Complete the blanks with numbers.

(1) a. At year $t = 1$, another *$1000* is added, while the previous quantity of **$1000** grows by 5%; therefore we have**(** Previous amount **)**1.05 + *1000*
= (_______________)1.05 + *1000*.

(3) b. At year $t = 2$, another **$1000** is added, while all the previous quantities grow by 5%; hence we have**(** Previous amount **)**1.05 + **1000** or

(**1000**(1.05) + *1000*)1.05 + **1000**, which, after distributing, becomes the sum of three terms:
= _______________ + _______________ + _______________
= 1000(___________ + ___________ + ___________)

(4) c. At year $t = 3$, yet another ***$1000*** is added to the previous, creating a total balance of
1000$(1.05)^3$ + *1000*$(1.05)^2$ + **1000**(1.05) + ***1000***

What is the meaning of the **1000**$(1.05)^3$ term in the expression for the balance at year $t = 3$?

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What is the meaning of the *1000*$(1.05)^2$ term in the expression for the balance at year $t = 3$?

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What is the meaning of the **1000**(1.05) term in the expression for the balance at year $t = 3$?

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What is the meaning of the ***last term*** in the above expression for the balance at year $t = 3$?

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(1) d. At year $t = 4$, after another $1000 is added to the previous, you have a total balance of
$1000(1.05)^4 + 1000(1.05)^3 + 1000(1.05)^2 + 1000(1.05) + 1000$.
At year $t = 5$ (five years from today), your total balance *prior to adding another $1000* would be
$1000(1.05)^5 + 1000(1.05)^4 + 1000(1.05)^3 + 1000(1.05)^2 + 1000(1.05)$.
This amount is less than $6000. What is this amount, accurate to two decimal places? $ __ __ __ __ . __ __

(2) e. By solving the equation $1000x^5 + 1000x^4 + 1000x^3 + 1000x^2 + 1000x = 6000$ graphically, you found that a rate of ________% would create a balance of $6000, since x is the growth factor.
What interest rate would be give you **$6600** (keeping the other conditions the same)? ______%
(Report accurate to 1 decimal place) Hint: Solve $1000x^5 + 1000x^4 + 1000x^3 + 1000x^2 + 1000x = 6600$.

(2) f. Solve the equation $1000x^5 + 1000x^4 + 1000x^3 + 1000x^2 + 1000x = 5000$. x = ___________
Interpret the solution in terms of the context of the situation:

____

OVER PLEASE

(1) g. The most important contribution to the total balance $1000x^5 + 1000x^4 + 1000x^3 + 1000x^2 + 1000x$ is made by which term? Select one: A. $1000x^5$ B. $1000x^4$ C. $1000x^3$ D. $1000x^2$ E. $1000x$

(9) 2. In general form, a polynomial function can be written as $p(x) = a_n x^n + a_{n-1}x^{n-1} + ... + a_1 x + a_0$;
for example, if $y = 9 - 5x^3 - 4x^7 - x^4 + 2x$, then $n =$ ___ and we have the following:
$a_7 =$ _____, $a_6 =$ _____, $a_5 =$ _____, $a_4 =$ _____, $a_3 =$ _____, $a_2 =$ _____, $a_1 =$ _____, and $a_0 =$ _____.

(1) 3. For the polynomial $g(x) = 3x^2 + 4x^5 + x - x^3 + 1$, which is true? Select one.
A. The degree of the polynomial is $4x^5$, since this term has the highest power of x.
B. The degree of the polynomial is $3x^2$, since this is the leading term.
C. The degree of the polynomial is 5, since this is the exponent on the term with the highest power.
D. The degree of the polynomial is 2, since this is the exponent on the leading term.
E. The degree of the polynomial is 11 = 2 + 5 + 1 + 3, since this is the sum of all the powers of x.

(1) 4. For the polynomial $g(x) = 3x^2 + 4x^5 + x - x^3 + 1$, which is true? Select one.
A. The coefficient of the third degree term is 1.
B. The coefficient of the third degree term is −1.
C. The coefficient of the third degree term is 2.
D. The *x term* has degree 0 and coefficient 1.
E. None of these are true.

(1) 5. The **constant term** of $g(x) = 3x^2 + 4x^5 + x - x^3 + 1$ is ______.

(1) 6. The degree of the constant term is always 0. Circle one: True False

(1) 7. When a polynomial function is written in descending powers of x,
the leading term is always the **first** term. Circle one: True False

(2) 8. After reading the box at the top of page 399, you can conclude that the **long-run behavior** of $g(x) = 3x^2 + 4x^5 + x - x^3 + 1$ looks like the graph of the power function whose equation is $y =$ _____, and the **long-run behavior** of $q(x) = 3x^6 - 2x^5 + 4x^2 - 1$ looks like the graph of the power function whose equation is $y =$ _____.

(1) 9. Pick the best answer. To find the **long-run** behavior of a polynomial, we look at
A. its constant term.
B. its leading coefficient.
C. its degree.
D. its leading term.
E. the number of terms it has.
F. its factored form.

(2) 10. You will need to be able to multiply two polynomials so that it will be in standard (expanded) form. A friend of yours has expanded the polynomial $(x-5)(x^4 - x^3 + 2)$ for you, but a fountain pen has leaked on the first and last terms. $(x-5)(x^4 - x^3 + 2) =$ [redacted] $- 6x^4 + 5x^3 + 2x$ [redacted]

The polynomial was written in descending powers of x.
What is the <u>first term</u> of the polynomial underneath the first ink blot? ________

What is the <u>last term</u> of the polynomial underneath the last ink blot? ______