Honors Algebra 2 **Name:_____**
Chapter 3 Review **Block:_____**

NON-CALCULATOR

3-1 In 1-2, determine if the following is a polynomial or not. If it is, put it in standard form and give the degree. If it is not, explain why not.

1) $-5x^2 - 7x^5 + 8 + 3x^4$ 2) $15x + 4\sqrt{x^3} - x^5$

3:1-2 In 3-5, perform the indicated operation.

3) $(3x^3 + 2x^2 - 4x + 1) + (-6x^3 + 11x + 6)$ 4) $(8 - 6x^2 + x^3 - x + 7x^4) - (3 - 5x^3 + 2x + 4x^4)$

5) $(-4x^3 + 2x - 9)(5x^2 - 3x + 7)$

3-3 6) Divide using long division: $\dfrac{9x^3 - 4x + 5}{3x - 1}$

3-3 Use synthetic substitution to evaluate the given polynomial for $x = -2$

7) $6x^4 - 3x^3 - 12x^2 - 5x + 6$ 8) $x^4 - 3x^3 - 11x^2 - 9$

3-4 9) Factor each expression

a) $27x^6 + 125$ b) $y^3 + 7y^2 + 2y + 14$ c) $6x^4 - 23x^2 + 20$

3-5 10) Determine all the solutions of $f(x) = 4x^3 + 12x^2 - x - 3$ by factoring.

3:4-6 Find all real and imaginary zeros of each function.

11) $f(x) = (2x-3)(4-x)(x+7)$

12) $f(x) = 2x^3 + x^2 - 13x + 6$; given -3 is a zero

13) $f(x) = 5x^4 + 3x^3 + 3x^2 + 3x - 2$; given -1 and $\frac{2}{5}$ are zeros.

3-6 14). Write the simplest polynomial function in <u>factored form</u> with the given zeros.

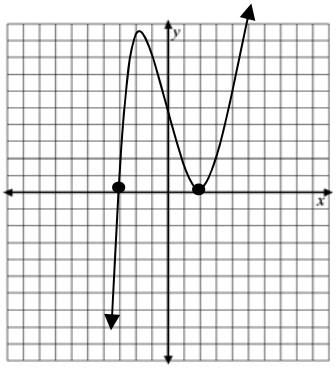
a) zeros of $-\frac{6}{5}$ and 2 (multiplicity of 2)

b) zeros of 3 and $\sqrt{2}$

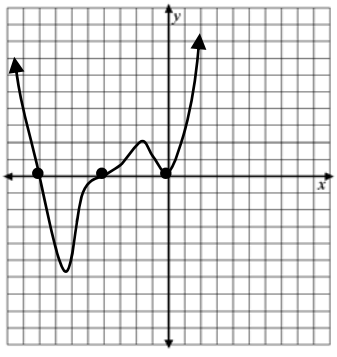
c) zeros of 5 and -3*i*

3-7 For the graphs below, identify whether the function has an even or odd degree and positive or negative leading coefficient. Also, identify the zeros and their multiplicity.

15)



16)



3:6-7 17) Can a 5th degree polynomial…

a) have 4 turning points? Explain.

b) have 6 zeros? Explain.

c) have exactly 2 real zeros of multiplicity 1? Explain.

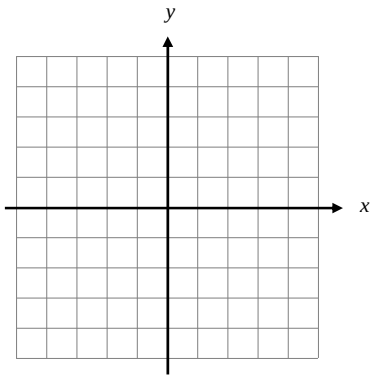
3-7 For questions 18-19, find each of the following for the given function:
a) List the degree.
b) Describe the end behavior using infinity notation.
c) Find the zeros (including their multiplicity).
d) Based on the information from parts (a) through (c), sketch a graph of the function. Your sketch should have a scale on the *x*-axis only.

18) $f(x) = -2x(x+3)(x-4)^2$

19) $f(x) = x^3 + 3x^2 - 9x - 27$

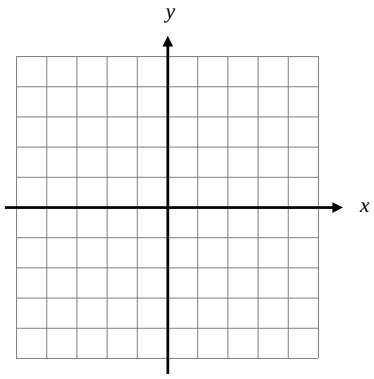
3-8 20) Consider the parent function $f(x) = x^3$. Rewrite given the following transformations and then sketch the transformed graph:

Vertical Stretch by a factor of 3 followed by a horizontal translation 2 units right and a vertical translation 2 units up.



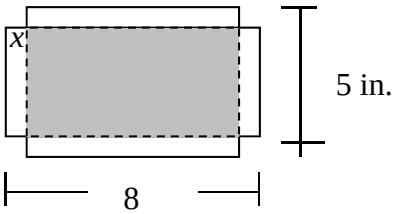
3-8 21) Consider the parent function $f(x) = x^4$. Rewrite given the following transformations and then sketch the transformed graph:

Reflection across the *x*-axis followed by a horizontal compression by a factor of $\frac{1}{4}$.



CALCULATOR ALLOWED

3-2 22) You are making an open box to hold paper clips out of a piece of cardboard that is 5 inches by 8 inches. The box will be formed by making an x inch by x inch square cut out of the corners as shown in the diagram and folding up the sides. **You want the box to have the greatest volume possible.**



a) Write an equation for the Volume of the box as a function of the length of the cut, *x*.

b) Use a graphing calculator to find how long you should make the cuts. Explain your reasoning.

c) What is the maximum volume of the box?

d) What will the dimensions of the finished box be?

3-7 Graph the polynomial to find all local minimum(s) and maximum(s). Then give the domain and range.

23) $f(x) = 2x^6 + 10x^3 - 7x + 3$

24) $f(x) = -x^5 + 6x^3 - 5x - 3$

3-9 25) Find and **verify** all zeros of the function. SHOW ALL WORK!!!

$y = 2x^3 + 3x^2 - 3x + 5$

3-9 26) The table shows the number of sandwiches sold each day at ta deli over 5 days.

Day	0	1	2	3	4	5
Sandwiches	196	57	72	101	89	66

a) Determine the degree of the polynomial that would fit the data. Explain how you know.

b) Write a polynomial function for the data.

c) Use your function from part b to determine the number of sandwiches expected to be sold on day 6.

REMEMBER: Any questions from the previous chapter reviews are fair game for this test!!!