Math 1314 College Algebra **Fall 2018 Exam II**
G-Number- **Name (Print):** _____

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1. (10 points) Find the Equation of the line:
   (a) Through (-1,2) and perpendicular to $y = 2x - 3$.

   (b) Passing through (-3,4) and (2,5).

2. (6 points) Find the value of $f(-2), f(0), f(3)$ for the following function.

$$f(x) = \begin{cases} -3x & for \quad x < -1 \\ 0 & for \quad x = -1 \\ 2x^2 + 1 & for \quad x > -1 \end{cases}$$

3. (5 points) Graph the following piece-wise function

$$f(x) = \begin{cases} \frac{1}{x} & for \quad x < 0 \\ \sqrt[3]{x} & for \quad x \geq 0 \end{cases}$$

4. (10 points) Using the transfer techniques graph and find domain and range for
   (a) $f(x) = -2(x+1)^4 + 1$

(b) $f(x) = -(x-5)^5 + 4$

5. (5 points) Find the polynomial with real zeros: -2 with multiplicity 2, 4 with multiplicity 1. and Degree =3 (choose any coefficient as you like)

6. (5 points) Determine whether following lines are parallel, perpendicular or neither. $y = 4x + 5$ and $y = \frac{-1}{4}x + 2$

7. (10 points) Find the Vertical Asymptotes, Horizontal Asymptotes and Oblique Asymptotes and Also give the domain. $f(x) = \frac{3(x^2-x-6)}{4(x^2-9)}$

8. (5 points) Find the average rate of change of the function $f(x) = x^3 - 2x + 1$ from 2 to 5.

9. (10 points) For the following function

$$f(x) = (x-5)^3(x+4)^2$$

find

(a) Find the real zeros and their multiplicity

(b) Determine where graph cross or touches (bounces back) at x-axis at the x-intercepts.

(c) Determine where graph cross or touches (bounces back) at x-axis at the x-intercepts.

(d) Find the number of maximum turning points

(e) Determine the end behavior

(f) Sketch the graph

10. (10 points) Check whether the following function are even, odd or neither. Also provide the reason for your decision.

(a)

$$f(x) = \frac{x^3}{x^5 - x}$$

(b)

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

(c) Whether the following is a polynomial or not

$$f(x) = \sqrt{x}(\sqrt{x} - 1)$$

11. (10 points) For $f(x) = 4x + 3$

(a) Find $f(-1)$ and

(b) $\frac{f(x+h)-f(x)}{h}$

12. (14 points) Sketch the following graphs by using the graphing techniques the part a) and b)

(a) Graph

$$f(x) = -\frac{1}{4}(x+2)^3 - 3$$

(b) Graph

$$f(x) = -\frac{1}{2}(x+3)^2 - 4$$

(c) Give the domain and graph

$$f(x) = \frac{1}{x-4} + 5$$

Bonus

13. (5 points) Graph the following function. Also give the domain and range

$$f(x) = 3\sqrt[3]{x-4} + 3$$