Math 2412 Pre-Calculus **Summer 2018 Exam II**
G-Number- **Name (Print):** _____

Choose Any 10 questions

1. (10 points) Simplify

(a) (3 points) Combine the logarithm

$$3ln2 + 2lnx - \frac{1}{2}ln(x+4)$$

(b) (4 points) Expand the logarithm

$$log_3 \frac{\sqrt{3x^5}}{y}$$

(c) (3 points) Evaluate the logarithm

$$log_2 6 - log_2 15 + log_2 20$$

2. (10 points) (a) (2 points) Express in exponential $log_3 81 = 4$

(b) (2 points) Express in logarithm $10^4 = 10,000$

(c) (2 points) Evaluate $log_6(36)$ **.**

(d) (2 points) Find the value of x when $log_x(6) = \frac{1}{2}$

(e) (2 points) Find the value of x $log_4(x) = 3$

3. (10 points) (2 point each part) Find the domain, vertical Asymptotes, Horizontal and Oblique (slant) Asymptotes (if exit), x-intercept, y-intercept of

$$f(x) = \frac{\sqrt{x-2}}{x-4}$$

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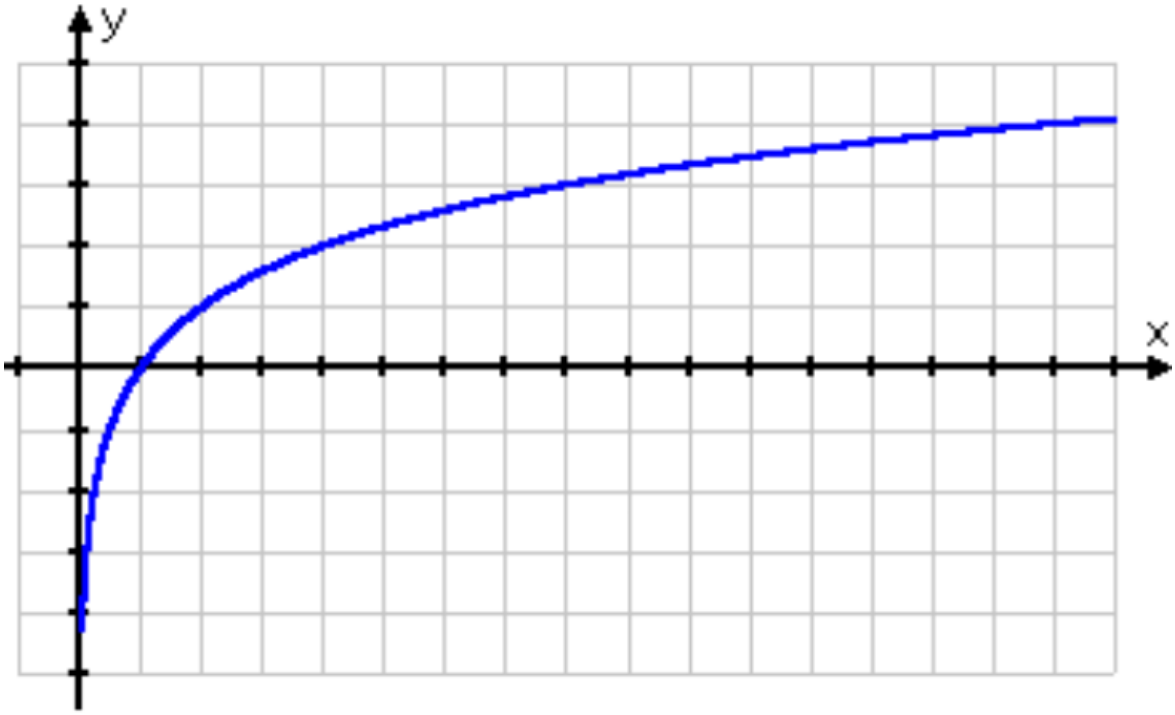
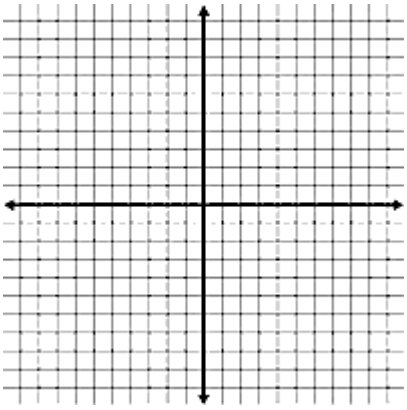
4. (10 points) Find Horizontal and Vertical asymptotes and Graph it $f(x) = \frac{3}{x+3}$

5. (10 points) Graph the following

(a) (5 points) Given the graph $log_2(x)$

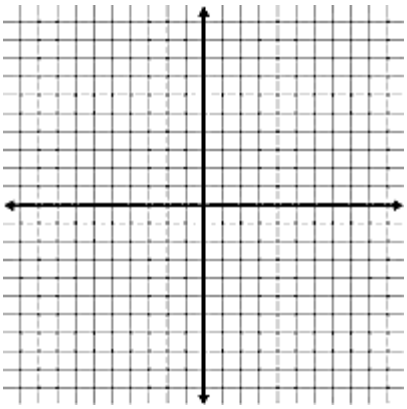


$$f(x) = log_2(x-3) + 2$$



(b) (5 points) Graph the following function

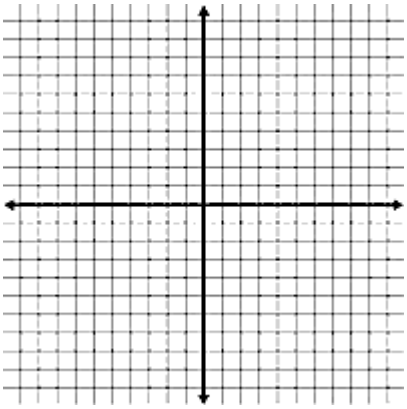
$$f(x) = 3^{x-3} - 2$$



6. (10 points) Graph the following

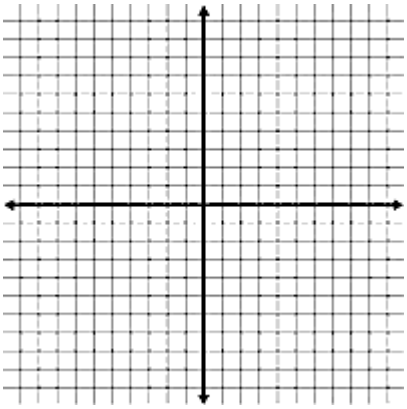
(a) (5 points) Graph

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



(b) (5 points) Graph

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



7. (10 points) (2 points each)For the given quadratic function

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

(a) Express in standard form

(b) Find Vertex

(c) Find X-intercept, Y-intercept

(d) Sketch the graph

(e) Find the domain and range

8. (10 points) If $600 is invested at an interest rate of 2.5% per year, find the amount of the investment at the end of 10 years for the quarterly compounding methods.

9. (10 points) Find the quotient and remainder by using the Synthetic division for

$$\frac{x^5 + 3x^3 - 6}{x - 1}$$

10. (10 points) Find the quotient and remainder by using the long division for

$$\frac{x^3 + 3x^2 + 4x + 3}{3x + 6}$$

11. (10 points) Check that whether x+2 is the factor of the polynomial $P(x) = x^3 + 2x^2 - 7$, why or why not give a reason. Use the remainder theorem to compute the remainder.

12. (5 Bonus points) Write down all the possible rational solution of $P(x) = 2x^3 + 2x^2 - 24$, Use Descrates Rules to determine how many positive and negative solution does it have?