**Math 2412 Pre-Calculus** **Summer 2018 Exam 1**
**G-Number-** **Name (Print):** _____

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**Choose Any 10 questions but Questions 5 and 7 are mandatory**

**1. (10 points) Simplify**

**(a) (7 points)**

$$\frac{(3-2x)^4(x+5)4x+(3-2x)^3 3(x+5)^2}{(3-2x)^7}$$

**(b) (3 points)**

$$\frac{4}{x+1}=\frac{3}{x}$$

**2. (10 points) Consider the function** $f(x) = 3x - 2$

**(a) (5 points) Evaluate** $f(2), \quad f(-3), \quad f(x+h)$

**(b) (5 points) find**

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

.

**3. (10 points) (a) (5 points) Find the domain of**

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

.

**(b) (5 points) Find the domain of $f^{-1}(x)$**

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

.

**4. (10 points) Solve the inequality**

**(a) (6 points)**

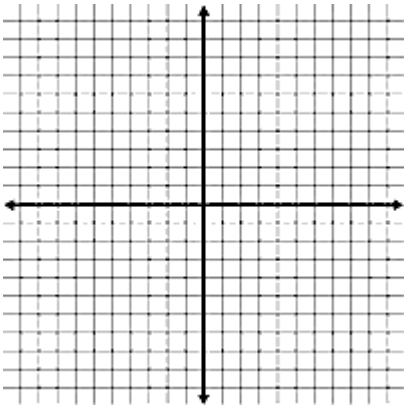
$$\frac{x^2(3-x)}{(x+2)} \leq 0$$

**(b) (4 points)** $2x - 5 \geq 3$**.**

**5. (13 points) Graph the following function**

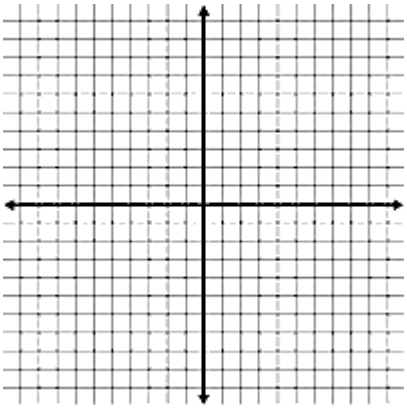
**(a) (3.5 points)**

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



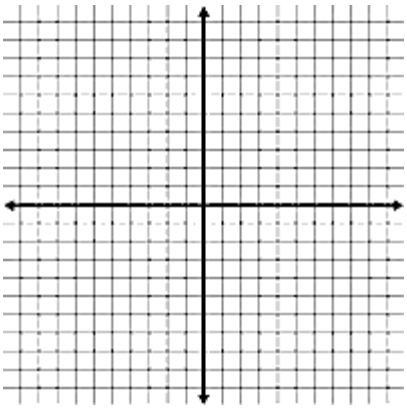
**(b) (3.5 points)**

$$f(x) = -(x-1)^2 + 2$$



**(c) (6 points)**

$$f(x) = \begin{cases} 1 & x < -2 \\ x^2 & -2 \le x \le 2 \\ x & x > 2 \end{cases}$$



**6. (10 points) Find the inverse of**

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

.

**7. (12 points) Given**

$$f(x) = 3x - 2 \quad \textbf{and} \quad g(x) = \frac{3}{2x - 3}$$

**then find i)** $f \circ g)(x)$**, ii) its domain and iii)** $f \circ g)(1)$**.**

**8. (10 points) A Pasture is twice as long as it is wide. Its area is** $115,200 ft^2$**. How wide is the pasture?**

**9. (10 points) A Movie star, unwilling to give is age, posed the following riddle to a gossip columist: "Seven years ago, I was 11 times as old as my daughter. Now I am 4 times as old as she is." How old is the movie star?**

**10. (10 points) Find the real solution of**

**(a) (6 points)**

$$\frac{1}{x-1} + \frac{1}{x+2} = \frac{5}{4}$$

**(b) (4 points)** $x^2 + 2x - 5 = 0$

**11. (10 points) Evaluate the piecewise function at the indicated values** $f(-2), \quad f(1), \quad f(3)$

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