Sample Exam I

NAME:

Part I. Absolute value equations. Solve. Be sure to check your solution(s).

1. $|4x - 5| = 9$

2. $|3x - 5| = 2$

Part II. Absolute value inequalities. Solve the inequality and express your solution as an inequality, in interval notation and graphically on the number line.

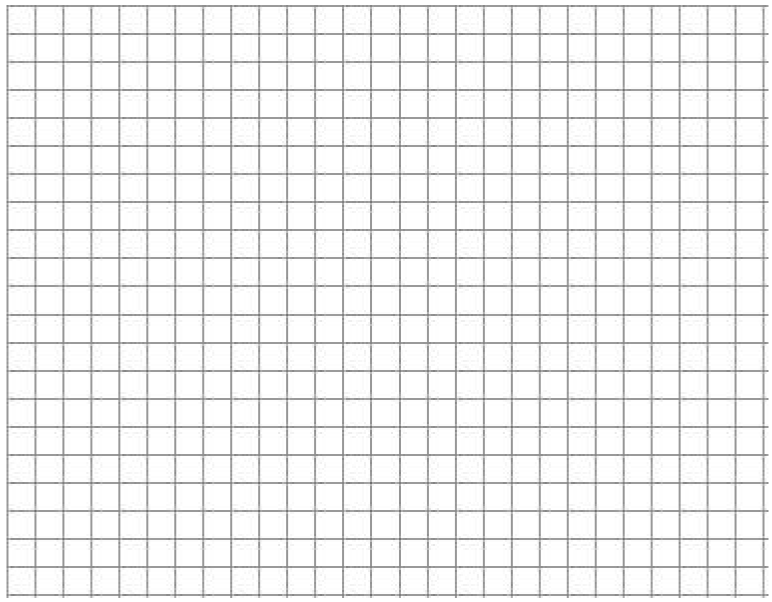
1. $|x - 6| < 2$

2. $|5x + 2| \geq \frac{3}{4}$

Part III. Lines.

1. Find the slope and the y-intercept of the line whose equation is $4x + 3y = 5$.

2. Find the slope and the y-intercept of the line whose equation is $3x - 2y + 6 = 0$. Use this information to graph the equation.



Part IV. Graphs. Use a maximum/minimum finder to determine the highest and lowest point on the graph in the given window.

$$y = .07x^5 - .3x^3 + 1.5x^2 - 2 \text{ in the window } (-3 \leq x \leq 2) \text{ and } (-6 \leq y \leq 6)$$

Part V. Solving equations graphically.

1. Use graphical approximation (a root finder or an intersection finder) to find a solution of the equation $x^5 + 5 = 3x^4 + x$ on the interval $(2, \infty)$.

2. Use graphical approximation (a root finder or an intersection finder) to find a solution of the equation $6x^3 - 5x^2 + 3x - 2 = 0$.

Part VI. Functions.

1. Determine whether the equation defines y as a function of x or defines x as a function of y.

$$y = 3x^2 - 12$$

2. $f(x) = \dfrac{x-3}{x^2+4}$. Find a) $f(-1)$ b) $f(0)$ c) $f(2)$

3. Assume $h \neq 0$. Compute and simplify the difference quotient $\dfrac{f(x+h)-f(x)}{h}$ for $f(x) = x - x^2$.

4. What is the natural domain of the function $g(u) = \dfrac{u^2+1}{u^2-u-6}$?

5. Draw the graph of a function f that satisfies the following four conditions:

   (1). domain $f = [-2, 4]$; (2). range $f = [-3, 5]$

   (3). f(-2)=5;

   (4). $f(x)$ starts increasing when $x = 2$